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DEFINITIONS
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INTRODUCTION

Definitions are given for most terms added to the *NASA Thesaurus* since 1976 as well as for many earlier terms. Definitions of more common or general scientific terms are given a NASA slant if one exists. Certain terms are not defined as a matter of policy: common place names, chemical elements, specific models of computers, and nontechnical terms. Other terms lack definitions because the *NASA Thesaurus* predates by a number of years the systematic effort to define terms. Nevertheless, definitions of older terms are continually being added.

The following data are provided for each definition: term in uppercase/lowercase form, definition *per se,* source, and year the term (not the definition) was added to the *NASA Thesaurus.* The NASA History Office is the authority for capitalization of NASA names. USE cross references from the *NASA Thesaurus* are also included in uppercase/lowercase form.

SOURCES OF DEFINITIONS

Definitions with no source given were constructed by lexicographers at the NASA Scientific and Technical Information (STI) Facility, who rely on the following sources for their information: experts in the field, literature searches from the NASA STI database, and specialized references, including those listed below.

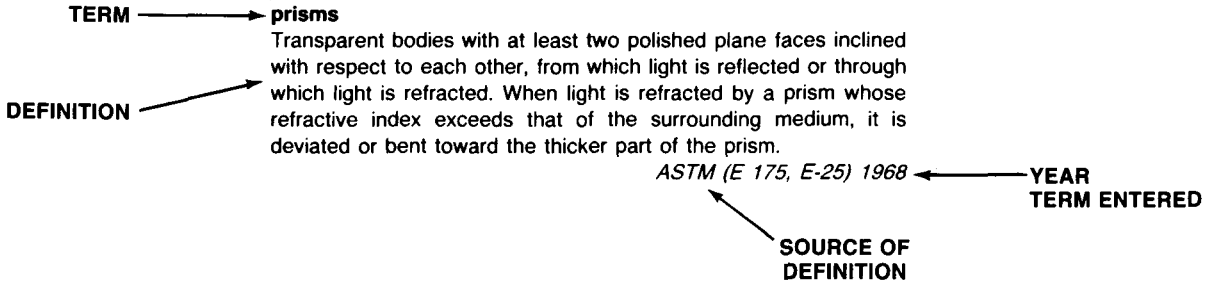
ASTM. *Compilation of ASTM Standard Definitions,* 6th edition. Philadelphia, PA, ASTM, 1986. Copyright, the American Society for Testing and Materials (ASTM). All rights reserved. Used with the permission of ASTM. Two ASTM sources are distinguished: standards are identified by an alphanumeric designation with no hyphen; committees are identified by an alphanumeric designation with a hyphen. The original definitions appeared in the *Annual Book of ASTM Standards.*

DOE. *Energy Data Base Subject Thesaurus* (DOE/TIC-7000-R7). Oak Ridge, TN, Department of Energy, 1987.

SP-7. *Dictionary of Technical Terms for Aerospace Use, NASA SP-7.* Washington, DC, NASA, 1965.

In some cases, definitions used from these sources have been subjected to editorial alterations, such as making a definition agree in number with the NASA form of the term.

TYPICAL TERM DEFINITION ENTRY



NASA THESAURUS

VOLUME 3
DEFINITIONS

A

aberration
In astronomy, the apparent angular displacement of the position of a celestial body in the direction of motion of the observer, caused by the combination of the velocity of the observer and the velocity of light. In optics, a specific deviation from perfect imagery, as, for example: spherical aberration, coma, astigmatism, curvature of field, and distortion. *SP-7 1968*

ablated nosetips
Use PANT program

ablation
The removal of surface material from a body by vaporization, melting, chipping, or other erosive process; specifically the intentional removal of material from a nose cone or spacecraft during high speed movement through a planetary atmosphere to provide thermal protection to the underlying structure. *SP-7 1968*

ablative materials
Materials, especially coating materials, designed to provide thermal protection to a body in a fluid stream through the loss of mass. *SP-7 1968*

abrasion
The surface loss of a material due to frictional forces. *ASTM (D 1566, D-11) 1968*

abrasives
Rocks, minerals, or other substances that, owing to their superior hardness, toughness, consistency, of other properties, are suitable for grinding, cutting, polishing, scouring, or similar use. *ASTM (D 653, D-18) 1968*

absolute zero
Temperature of -273.16 deg. C or -459.69 deg. F or 0 deg. K at which molecular motion vanishes and a body has no heat energy. *1980*

absorptance
The ratio of the radiant flux absorbed by a body to that incident upon it. *SP-7 1968*

absorption
The process by which radiant energy is absorbed and converted into other forms of energy. In general, the taking up or assimilation of one substance by another. In vacuum technology gas entering the interior of a solid. *SP-7 1968*

absorption bands
Use absorption spectra

absorption coefficient
Use absorptivity

absorption cooling
Refrigeration in which cooling is effected by the expansion of liquid ammonia into gas and the absorption of the gas by water. The ammonia is reused after the water evaporates. *1980*

absorption cross sections
In radar, cross sections characterized by the amount of power removed from a beam by absorption of radio energy by a target to the power in the beam incident upon the target. Used for capture cross sections. *SP-7 1968*

absorption spectra
The arrays of absorption lines and absorption bands which result from the passage of radiant energy from a continuous source through a selectively absorbing medium cooler than the source. Used for absorption bands and spectral absorption. *SP-7 1968*

absorptive index
Use absorptivity

absorptivity
The capacity of a material to absorb incident radiant energy, measured as the absorptance of a specimen of material thick enough to be completely opaque, and having an optically smooth surface. Used for absorption coefficient and absorptive index. *SP-7 1968*

accelerated life tests
Methods designed to approximate, in a short time, the deteriorating effects under normal long-term service conditions. *ASTM (D 1566, D-11) 1969*

acceleration (physics)
The rate of change of velocity. The act or process of accelerating or the state of being accelerated. Used for boost and G force. *SP-7 1968*

accelerators
Machines that ionize gases and electrically accelerate the ions onto targets. *ASTM (E 385, E-10) 1968*

accelerometers
Transducers which measure acceleration or gravitational forces capable of imparting acceleration. *SP-7 1968*

access control
The procedures for providing systematic, unambiguous, orderly, reliable and generally automatic use of communication lines, channels, and networks for information transfer. *1980*

acclimatization
The adjustments of a human body or other organism to a new environment; the bodily changes which tend to increase efficiency and reduce energy loss. Used for deacclimatization. *SP-7 1968*

accommodation coefficient
The ratio of the average energy actually transferred between a surface and impinging gas molecules which are scattered by the surface to the average energy which would theoretically be transferred if the impinging molecules reached complete thermal equilibrium with the surface before leaving the surface. Used for thermal accommodation coefficients. *SP-7 1968*

accounting
The practice and system of recording and summarizing business and financial transactions and reporting as well as verifying and analyzing their results. *1982*

accretion disks
Rotation disks of matter surrounding an astronomical object, such as a star, galactic nucleus, black hole, etc., which is accumulated gravitationally by the object. *1982*

accumulators
Devices or apparatus that accumulate or store. Used for collectors. *SP-7 1968*

accumulators (computers)
In computer technology, devices which store a number and upon receipt of another number add it to the number already stored and store the sum. *SP-7 1968*

accuracy
The degree of agreement of the measurements with the true value of the magnitude of the quantity measured. Used for error band and fidelity. *ASTM (E 319, E-41) 1968*

ACEE program
A NASA program started in 1975 to reduce fuel consumption for transport aircraft through the study of structural and aerodynamic energy efficiency as well as engine energy efficiency consisting of engine component improvement, new energy efficient engines, and advanced turbopropellers. The acronym stands for aircraft energy efficiency. Used for Aircraft Energy Efficiency program and energy efficiency transport program. *1982*

acetation
Use acetylation

acetylation
Substitution of an acetyl radical for an active hydrogen. Specifically, formation of cellulose acetate from cellulose. Used for acetation. *ASTM (D 1695, D-23) 1968*

acid rain
Low pH rainfall resulting from atmospheric reactions of aerosols containing chlorides and sulfates (or other negative ions). *1977*

acoustic delay lines
Devices used in a communications link or a computer memory in which the signal is delayed by the propagation of sound waves. Used for sonic waveguides. *SP-7 1968*

acoustic emission
The stress and pressure waves generated during dynamic processes in materials and used in assessing structural integrity in machined parts. *1977*

acoustic excitation
The process of inducing vibration in a structure by exposure to sound waves. *SP-7 1968*

acoustic generators
Use sound generators

acoustic levitation
Method by which molten materials in space are suspended during processing experiments in the low gravity environment. Also, the use of very intense sound waves to keep a body suspended, thereby eliminating any container contact. *1980*

acoustic measurement
Measurement of properties, quantities, or conditions of acoustical i.e., mechanical waves. Used for sound measurement. *DOE 1968*

acoustic microscopes
Instruments which use acoustic radiation at microwave frequencies to allow visualization of microscopic detail exhibited in elastic properties of objects. Used for scanning laser acoustic microscope (SLAM). *1980*

acoustic radiation
Use sound waves

acoustic retrofitting
Modification, especially of aircraft, to effect noise reduction; specifically the introduction of absorber materials and jet noise silencers. *1977*

acoustic streaming
Unidirectional flow currents in a fluid that are due to the presence of sound waves. *SP-7 1968*

acoustic velocity
The speed of propagation of sound waves. Used for sonic speed, sound barrier, and sound velocity. *SP-7 1968*

acoustic vibrations
Use sound waves

acoustics
The study of sound, including its production, transmission, and effects. Those qualities of an enclosure that together determine its character with respect to distinct hearing. Used for sound. *SP-7 1968*

ACPL (Spacelab)
Use atmospheric cloud physics lab (Spacelab)

actinide series
The series of elements beginning with actium, Element No. 89, and continuing through lawrencium, Element No. 103. *ASTM (C 859, C-26) 1968*

actinographs
Use actinometers

actinometers
The general name for instruments used to measure the intensity of radiant energy, particularly that of the sun. Used for actinographs and emissographs. *SP-7 1968*

activated sludge
A semiliquid mass removed from the liquid flow of sewage and subjected to aeration and aerobic microbial action. The end product is dark to golden brown, partially decomposed, granular and flocculent, and has an earthy odor when fresh. *1977*

active control
The automatic activation of various control surface functions in aircraft. *1980*

active satellites
Satellites which transmit a signal, in contrast to passive satellites. *SP-7 1968*

actuators
Mechanisms to activate process control equipment, e.g., valves. Used for cartridge actuated devices, hydraulic actuators, and triggers. *DOE 1968*

acuity
The keeness of ability to detect and discriminate. *ASTM (E 253, E-18) 1968*

Ada (programming language)
A programming language based on PASCAL, originally developed on behalf of the US Department of Defense for use in embedded computer systems. It is named Ada in honor of Augusta Ada Byron, countess of Lovelace, primarily due to the fact that she was the assistant and patron of Charles Babbage and is considered the world's first programmer. *1982*

adaptation
The adjustment, alteration or modification of an organism to fit it more perfectly for existence in its environment. *SP-7 1968*

adapters
Devices or contrivances used or designed primarily to fit or adjust one thing to another. Devices, appliances or the like used to alter something so as to make it suitable for a use for which it was not originally designed. *SP-7 1968*

adaptive optics
Real-time optical correction for atmospheric perturbations and other system error sources. *1977*

additives
Materials or substances added to something else for a specific purpose. Used for doping (additives). *SP-7 1968*

adducts
Chemical compounds with weak bonds, e. g., occlusive or Van der Waal bonds. *DOE 1968*

adiabatic demagnetization cooling
Use of paramagnetic salts cooled to the boiling point of helium in a strong magnetic field, then thermally isolated and removed from the field to demagnetize the salts and attain temperatures of 10(-3) K. *1980*

adsorbents
Materials which take up gases by adsorption. *SP-7 1968*

adsorption
The adhesion of a thin film of liquid or gas to the surface of a solid substance. The solid does not combine chemically with the adsorbed substance. *SP-7 1968*

advanced range instrumentation aircraft
An EC-135 aircraft configured for reception recording and real-time relay of telemetry data. *1981*

advanced technology laboratory
An all-pallet payload utilizing the Space Shuttle and the European Spacelab and designed to accommodate 8 to 15 experiments per mission. *1985*

Advanced X Ray Astrophysics Facility
Use X Ray Astrophysics Facility

advection
The process of transport of an atmospheric property solely by the mass motion of the atmosphere; also, the rate of change of the value of the advected property at a given point. *SP-7 1968*

aeroassist
Changing orbit size by utilizing aerobraking, aerocapture, or aeromaneuvering. *1982*

aerobiology
The study of the distribution of living organisms freely suspended in the atmosphere. *SP-7 1968*

aerobraking
Changing orbit size by using the upper atmosphere to create drag. *1982*

aerocapture
Making use of the atmosphere of a planet or planetary satellite by capturing the object and reducing the orbit size so that it remains in orbit or lands on the body. *1982*

aerodynamic buzz
Use flutter

aerodynamic chords
Use chords (geometry)

aerodynamic coefficients
Any nondimensional coefficients relating to aerodynamic forces or moments, such as a coefficient of drag, a coefficient of lift, etc. Used for lift coefficients. *SP-7 1968*

aerodynamic forces
The force exerted by a moving gaseous fluid upon a body completely immersed in it. Used for Glauert coefficient. *SP-7 1968*

aerodynamic heating
The heating of a body produced by the passage of air or other gases over its surface. *DOE 1968*

aerodynamic lift
Use lift

aerodynamics
The science that deals with the motion of air and other gaseous fluids, and the forces acting on bodies when the bodies move through such fluids, or when such fluids move against or around the bodies. Used for hydroaeromechanics. *SP-7 1968*

aeroelastic research wings
Wings that are designed with less than normal stiffness to test devices that suppress flutter. *1983*

aeroelasticity
The study of the response of structurally elastic bodies to aerodynamic loads. *SP-7 1968*

aeroembolism
The formation or liberation of gases in the blood vessels of the body, as brought on by a too-rapid change from a high, or relatively high, atmospheric pressure to a lower one. *SP-7 1968*

aerology
The study of the free atmosphere throughout its vertical extent, as distinguished from studies confined to the layer of the atmosphere adjacent to the earth's surface. *SP-7 1968*

aeromagneto flutter
Use flutter

aeromaneuvering
Changing orbit size or plane or both by entering the upper atmosphere to create drag or lift or both. *1982*

aeromaneuvering orbit to orbit shuttle
Proposed reusable upper stage for the Space Shuttle superseded by the orbit transfer vehicle. Used for AMOOS. *1979*

aeronomy
The study of the upper regions of the atmosphere where ionization, dissociation, and chemical reactions take place. *SP-7 1968*

aerosols
Dispersions of solid or liquid particles in gaseous media. *ASTM (D 1356, D-22) 1968*

aerospace medicine
That branch of medicine dealing with the effects of flight through the atmosphere or in space upon the human body and with the prevention or cure of physiological or psychologicalmalfunctions arising from these effects. *SP-7 1968*

aerospace safety
The engineering assessment and analysis of systems, subsystems, and functions of spacecraft, missiles, advanced aircraft and ground support in order to identify hazards associated with such systems and to design procedures that eliminate those hazards or determine tolerable safety levels. *1982*

aerospace technology transfer
Technology transfer germane to aircraft and space vehicles, their propulsion, guidance, etc. *1977*

aerospace vehicles
Vehicles capable of flight within and outside the sensible atmosphere. *SP-7 1968*

aerostats
Use airships

aerothermodynamics
The study of aerodynamic phenomena at sufficiently high gas velocities that thermodynamic properties of gas are important. *SP-7 1968*

aerothermoelasticity
The study of the response of elastic structures to the combined effects of aerodynamic heating and loading. *SP-7 1968*

aerozine
A rocket fuel consisting of a mixture of hydrazine and unsymmetrical dimethylhydrazine (UDMH). *1968*

AFC (control)
Use automatic frequency control

afterbodies
Companion bodies that trail satellites. Sections or pieces of rockets or spacecraft that enter the atmosphere unprotected behind nose cones or other bodies that are protected for entry. afterparts of vehicles. Used for cylindrical afterbodies and sterns. *SP-7 1968*

afterburners
Use afterburning

afterburning
Irregular burning of fuel left in the firing chamber of a rocket after cutoff. The function of an afterburner, a device for augmenting the thrust of a jet engine by burning additional fuel in the uncombined oxygen in the gases from the turbine. Used for afterburners. *SP-7 1968*

afterglows
Broad, high arches of radiance or glow seen occasionally in the western sky above the highest clouds in deepening twilight, caused by the scattering effect of very fine particles of dust suspended in the upper atmosphere. Also, the transient decay of a plasma after the power has been turned off. *SP-7 1968*

AGC (control)
Use automatic gain control

agricultural aircraft
Light aircraft specially equipped for agricultural applications such as crop dusting. *1979*

AgRISTARS project
A multiagency program utilizing Landsat remote sensing data to predict crop yields, land use, and detecting pollution. Used for Crop Inventories by Remote Sensing. *1980*

agrophysical units
Geographic areas defined for statistical purposes by AgRISTARS personnel whose boundaries are based on natural rather than political lines for the purpose of comparing similar agricultural regions. *1983*

AGT
Use automated guideway transit vehicles

AH-1G helicopter
US Army designation for the Bell Model 209 Hueycobra attack helicopter powered by a single Avco Lycoming T53-L-13 turboshaft engine. *1980*

air
The mixture of gases comprising the earth's atmosphere. *SP-7 1968*

air breathing boosters
Boosters which are possible substitutes for rocket engines and which have inlets for oxygen sources for their engines rather than carrying their own oxygen as in a conventional rocket. *1981*

air conditioning
The simultaneous control of all, or at least three, of those factors affecting both the physical and chemical conditions of the atmosphere within any structure. These factors include temperature, humidity, motion, distribution, dust, bacteria, odor, and toxic gases. *ASTM (E 41, G-3) 1968*

air cushion landing systems
Landing systems based on the ground effect principle whereby a stratum of air is utilized as the aircraft ground contacting medium (in place of landing gear). *1977*

air law
The body of domestic and/or international laws dealing with regulations and liabilities in civil or military aviation. *1980*

air locks
A stoppage or diminution of flow in a fuel system, hydraulic system, or the like, caused by pockets of air or vapor. Also chambers capable of being hermetically sealed that provide for passage between two places of different pressure as between an altitude chamber and the outside atmosphere. *SP-7 1968*

air pollution
The presence of unwanted material in the air. The term 'unwanted material' here refers to material in sufficient concentrations, present for a sufficient time, and under circumstances to interfere significantly with comfort, health, or welfare of persons, or with the full use and enjoyment of property. Used for atmospheric impurities. *ASTM (D 1356, D-22) 1968*

air sickness
Use motion sickness

air slew missiles
Solid propellant rockets utilizing thrust vector control. *1977*

airborne integrated reconnaissance system
Aerial reconnaissance system incorporating various modes of detection. Used for AIRS (reconnaissance sys). *1977*

airborne radar approach
The use of airborne radar for aircraft approach control -- the radar cursor technique. *1980*

aircraft construction materials
A general term designating the materials used in manufacturing an aircraft. *1976*

Aircraft Energy Efficiency program
Use ACEE program

aircraft noise prediction
Use noise prediction (aircraft)

aircraft power supplies
Electrical sources for the normal operation of aircraft. *1984*

aircraft runup
Final engine check prior to takeoff. *1980*

aircraft spin
A prolonged stall in fixed-wing aircraft characterized by a sustained spiral descent, usually with the nose down. *1979*

airfoil characteristics
Use airfoils

airfoil oscillations
Periodic motions experienced by airfoils in aerodynamic conditions. *1987*

airfoils
Structures, pieces, or bodies, originally likened to foils or leaves in being wide and thin, designed to obtain a useful reaction on themselves in their motion through the air. Used for airfoil characteristics. *SP-7 1968*

airframes
The assembled structural and aerodynamic components of an aircraft or rocket vehicle that support the different systems and subsystems integral to the vehicle. *SP-7 1968*

airglow
The quasi-steady radiant emission from the upper atmosphere as distinguished from the sporadic emission of the auroras. Used for atmospheric emission. *SP-7 1968*

airport security
Organization of trained security personnel, surveillance and screening devices, and procedures used for the protection of airport and airline property, aircraft, passengers, employees, and visitors from injury, air piracy, and other unauthorized acts. *1977*

AIRS (reconnaissance sys)
Use airborne integrated reconnaissance system

airships
Propelled and steerable dirigibles dependent on gases for flotation. Used for aerostats and dirigibles. *DOE 1968*

airspace
The atmosphere above a particular portion of the earth, usually defined by the boundaries of an area on the surface projected perpendicularly upward. *SP-7 1968*

Aitken nuclei
Microscopic particles in the atmosphere which serve as condensation nuclei for droplet growth during the rapid adiabatic expansion produced by an Aitken dust counter. *1978*

albedo
The ratio of the amount of electromagnetic radiation reflected by a body to the amount incident incident upon it, often expressed as a percentage, as, the albedo of the earth is 34%. *SP-7 1968*

aldehydes
Carbonyl groups to which a hydrogen atom is attached; the first stage of an alcohol; - CHO. *ASTM (D 1695, D-23) 1968*

Alfven waves
Use magnetohydrodynamic waves

AlGaAs
Use aluminum gallium arsenides

algae
Any plants of a group of unicellular and multicellular primitive organisms that include the Chlorella, Scenedesmus, and other genera. Used for algal bloom. *SP-7 1968*

algal bloom
Use algae

algorithms
Special mathematical procedures for solving a particular type of problem. *SP-7 1968*

alkali metals
Metals in group IA of the periodic system; namely, lithium, sodium, potassium, rubidium, cesium, and francium. *SP-7 1968*

alkali vapor lamps
Lamps in which light is produced by an electric discharge between electrodes in an alkali vapor at low or high pressures. *1977*

alkalinity
The state of being alkaline. *1981*

alloys
Substances having metallic properties and being composed of two or more chemical elements of which at least one is an elemental metal. *SP-7 1968*

alluvium
Soil, the constituents of which have been transported in suspension by flowing water and subsequently deposited by sedmentation. *ASTM (D 653, D-18) 1973*

aloha system
A multiple random access communications scheme in which there is a nonfixed allocation of channel capacity, so that the channel is available to any terminal whenever it has a packet ready for transmission. *1981*

alpha decay
The radioactive transformation of a nuclide by alpha-particle emmission. *SP-7 1968*

alpha particles
Positively charged particles emitted from the nuclei of certain atoms during radioactive disintegration. Used for alpha radiation. *SP-7 1968*

alpha radiation
Use alpha particles

Alpine meteorology
Wind, precipitation, atmospheric physics, and other climatological phenomena peculiar to the Alps and/or other similar mountainous areas. *1979*

altimeters
Instruments for measuring height above a reference datum. *SP-7 1968*

altitude
In astronomy, angular displacement above the horizon. Also height, especially radial distance as measured above a given datum, as average sea level. *SP-7 1968*

altitude acclimatization
A physiological adaptation to reduced atmospheric and oxygen pressure. *SP-7 1968*

altitude sickness
In general, any sickness brought on by exposure to reduced oxygen tension and barometric pressure. *SP-7 1968*

aluminides
Intermetallic compounds of aluminum and a transition metal. *1987*

aluminum arsenides
Binary compounds of aluminum with negative, trivalent arsenic. *1978*

aluminum boron composites
Structural materials composed of aluminum alloys reinforced with boron fibers (filaments). *1976*

aluminum gallium arsenides
Compounds exhibiting characteristics suitable for use in laser devices, light-emitting diodes, solar cells, etc. Used for AlGaAs. *1978*

aluminum graphite composites
Structural materials composed of aluminum alloys reinforced with graphite. *1976*

alveolar air
The respiratory air in the alveoli (air sacs) deep within the lungs. *SP-7 1968*

alveoli
The terminal air sacs deep within the lungs. *SP-7 1968*

Amalthea
Innermost satellite of Jupiter. *1978*

ambient temperature
Temperature of surrounding medium. Used for environmental temperature. *DOE 1968*

AMOOS
Use aeromaneuvering orbit to orbit shuttle

Amor asteroid
One group of earth-approaching asteroids with orbits between the planets Mars and Jupiter. Used for Minor Planet 1221. *1978*

amphiboles
A group of dark, rock-forming, ferromagnesian silicate minerals closely related in crystal form and composition. *DOE 1968*

amplifiers
Devices which enable an input signal to control a source of power whose output is an enlarged reproduction of the essential characteristics of the signal. Used for electronic amplifiers. *SP-7 1968*

amplitude modulation
In general, modulation in which the amplitude of a wave is the characteristic subject to variation. *SP-7 1968*

amplitudes
The maximum value of the displacement of a wave or other periodic phenomenon from a reference position. Also, angular distance north or south of the prime vertical; the arc of the horizon, or the angle at the zenith between the prime vertical and a vertical circle, measured north or south from the prime vertical to the vertical circle. *SP-7 1968*

ampoules
Glass containers designed to be filled and sealed by fusion of the glass neck. *ASTM (C 162, C-14) 1968*

AMTV
Use automated mixed traffic vehicles

analog computers
Computers that work on the principle of measuring, as distinguished from counting, in which the input data is analogous to a measurement continuum such as linear lengths, voltages, or resistances which can be manipulated by the computer. *SP-7 1968*

analog to digital converters
Devices for converting non-digital information into digits. Used for digitizers. *DOE 1968*

analysis (mathematics)
That part of the field of mathematics which arises from the calculus and which deals primarily with functions. *1968*

analysis of variance
A systematic statistical procedure for determining the sources and the magnitudes of the errors present in a measurement process, and for assessing the significance of differences between materials, processes, or test methods under study.
ASTM (D 3980, D-1) 1971

andesite
Volcanic rock composed essentially of andesine and one or more mafic constituents. *DOE 1968*

angle of attack
The angle between a reference line fixed with respect to an airframe and a line in the direction of movement of the body. *SP-7 1968*

angles (geometry)
The inclination to each other of two intersecting lines, measured by the arc of a circle intercepted between the two lines forming the angle, the center of the circle being the point of intersection.
SP-7 1968

angular acceleration
The rate of change of angular velocity. *SP-7 1968*

angular motion
Use angular velocity

angular resolution
Specifically the ability of a radar to distinguish between two targets solely by the measurement of angles. *SP-7 1968*

angular velocity
The change of angle per unit time; specifically, in celestial mechanics, the change in angle of the radius vector per unit time. Used for angular motion. *SP-7 1968*

Anik satellites
A series of geostationary communication satellites operated by Telesat which is partly owned by the Canadian government and partly owned by private enterprise. The name 'Anik' is derived from an Eskimo word meaning 'brother'. It was so designated because of its partial use in the Far North. *1983*

anisotropy
Having different properties in different directions. Used for nonisotropy, onisotropy, photothermotropism, and thermotropism.
ASTM (D 653, D-18) 1968

annealing
Application of heat energy to a material cooling at a suitable rate to relieve stresses, change certain properties, improve machinability, or for realignment of atoms in a distortedlattice as caused, for example, by radiation damage. *SP-7 1968*

annular ducts
Ring-shaped openings for the passage of fluids (gases, etc.) designed for optimum aerodynamic flow properties for the application involved. *1979*

annular suspension and pointing system
In the Shuttle era, high accuracy pointing and stabilization of an experiment payload. *1980*

anodes
The positive pole or electrode of any electron emitter, such as an electron tube or an electric cell. *SP-7 1968*

anodic stripping
The removal of metal coatings. *1980*

anodizing
An electrolytic oxidation process in which the surface of a metal, when anodic, is converted to a coating having desirable protective, decorative, of functional properties. *ASTM (B 374, B-8) 1968*

anomalies
In general, deviations from the norm. *SP-7 1968*

anorthosite
A group of essentially monomineralic plutonic igneous rocks composed almost entirely of plagioclass feldspar. *DOE 1968*

anoxia
A complete lack of oxygen available for physiological use within the body. *SP-7 1968*

antenna arrays
Systems of antennas coupled together to obtain directional effects, or to increase sensitivity. *SP-7 1968*

antennas
Conductors or systems of conductors for radiating or receiving radio waves. *SP-7 1968*

anthropology
The study of the interrelations of biological, cultural, geographical, and historical aspects of man. *DOE 1968*

anticlines
Geologic formations characterized by folds the core of which contain stratigraphically older rocks; they convex upward. Used for anticlinoria. *DOE 1974*

anticlinoria
Use anticlines

antifouling
Measures taken to prevent corrosion or the accumulation of organic or other residues or growths on operating machanisms, especially in underwater environments. *1981*

antigravity
A hypothetical effect that would arise from cancellation by some energy field of the effect of the gravitational field of the earth or other body. *SP-7 1968*

antimisting fuels
Fuels which have an additive to reduce misting and thus create safer fuels. *1985*

antinodes
Either of the two points on an orbit where a line in the orbit plane, perpendicular to the line of nodes and passing through the focus intersects the orbit. Also a point, line, or surface in a standing wave where some characteristic of the wave field has maximum amplitude. *SP-7 1968*

antioxidants
Compounding ingredients used to retard deterioration caused by oxidation. *ASTM (D 1566, D-11) 1968*

antiparticles
Particles with a charge of opposite signs to the same particles in normal matter. *SP-7 1968*

antipodes
Anything exactly opposite to something else. Particularly, that point on the earth 180 deg. from a given place. *SP-7 1968*

antiquities
Man made objects or surviving parts or fragments from the past. *1985*

antiradiation missiles
Missiles that attack radiating targets such as radar transmitters, etc. *1980*

AOIPS
Use atmospheric & oceanographic inform sys

APL (programming language)
'A Programming Language' is a high level interactive computer language primarily designed for mathematical applications. It was developed by Kenneth Iverson in 1962. It is characterized by extensive operators and array handling capability. NASA Goddard was one of the first users and was instrumental in introducing APL to the computer community. *1983*

apnea
Use respiration

Apollo asteroids
Earth grazing asteroids in orbits between Mars and Jupiter, and crossing the earth's orbit. This group contains 19 known asteroids. *1978*

approach and landing tests (STS)
A series of flight maneuvers involving the Space Shuttle. *1978*

aquatic plants
Plants growing in or on water. *1981*

aquiculture
The cultivation (breeding, raising, and harvesting) of fish, mollusks, shellfish, and/or other aquatic life as sources of food. *1977*

aquifers
Bodies of rock that contain sufficient saturated permeable material to conduct ground water and to yield economically significant quantities of ground water to wells and springs. *DOE 1974*

aragonite
A white, yellowish, or gray orthorhombic mineral, that contains calcium carbonate. *DOE 1968*

archaebacteria
Organisms belonging to the taxonomic kingdom of the same name which are characterized by distinct t- and r-RNAs, the absence of peptoglycan cell walls and their possible replacement by a proteinaceous coat, ether-linked lipids from phytanyl chains, and occurance in unusually harsh habitats, e.g., methane, halide and thermoacidic environments. These hardy bacteria are significant in the study of the origin of life. *1987*

architecture (computers)
The design of system and logic organization and information flow relationships in a computer rather than the circuit and component features. *1976*

arguments (mathematics)
Use independent variables

Ariel
A satellite of Uranus orbiting at a mean distance of 192,000 kilometers. *SP-7 1986*

Ariel 5 satellite
One in a series of artificial satellites launched for Britain by the United States. *1976*

Aries sounding rocket
The largest in terms of weight and volume of the sounding rockets. It has a 44 inch payload capacity. *1982*

ARIP (impact prediction)
Use computerized simulation

ARPA computer network
The 'Advanced Research Projects Agency' of the Department of Defense nationwide computer network incorporating digital communication between large numbers of dissimilar computers as well as direct access to programs, data, storage, etc. shared by all terminals. *1977*

arrhythmia
Absence of rhythm, as, for example, in heart beat. *SP-7 1968*

arrow wings
Aircraft wings of V-shaped planform, either tapering or of constant chord, suggesting a stylized arrowhead. *SP-7 1968*

artificial gravity
A simulated gravity established within a space vehicle by rotation or acceleration. *SP-7 1968*

artificial intelligence
A subfield of computer science concerned with the concepts and methods of symbolic inference by a computer and the symbolic representation of the knowledge to be used in making inferences. Used for machine recognition. *DOE 1968*

artificial satellites
Man-made satellites. *SP-7 1968*

aspect ratio
The ratio of the square of the span of an airfoil to the total airfoil area, or the ratio of its span to its mean chord. *SP-7 1968*

asphalt
A dark brown to black cementitious material, in which the predominating constituents are bitumens which occur in nature or are obtained in petroleum processing. *ASTM (D 1079, D-8, D-4) 1968*

asphaltenes
Components of bitumens that are soluble in carbon disulphide but not in paraffin naphtha, constitute the solid dispersed particles of the bitumens, and consist of high molecular weight hydrocarbons. *1980*

aspiration
Use vacuum

association reactions
Gas phase chemical processes in which two molecular species and B react to form a larger molecule AB. In astrophysics these processes are involved in the 'condensation' of small gaseous molecules into larger species. *1980*

associative processing (computers)
Byte-variable computer processing with multifield search, arithmetic, and logic capability. *1977*

asteroid belts
The location of the orbits of most of the minor planets (estimated at a half million asteroids) between Mars and Jupiter; about 2000 asteroids have been assigned numbers and names. *1978*

asteroid capture
The transfer of an asteriod or comet from the influence of a planet into that of another planet or neutral satellite. *1979*

asteroid missions
Space missions for the study of asteroids and related celestial bodies. *1978*

asteroids
Small celestial bodies revolving around the sun, most having orbits between those of Mars and Jupiter. *SP-7 1968*

astrobiology
Use exobiology

astrodynamics
The practical application of celestial mechanics, astroballistics, propulsion theory, and allied fields to the problem of planning and directing the trajectories of space vehicles. *SP-7 1968*

astrolabes
Instruments designed to observe the positions and measure the altitudes of celestial bodies. *1981*

astronomical coordinates
Coordinates defining a point on the surface of the earth, or of the geoid, in which the local direction of gravity is used as a reference. *SP-7 1968*

astronomy
The science that treats of the location, magnitudes, motions, and constitution of celestial bodies and structures. Used for celestial observation. *SP-7 1968*

astrophysics
A branch of astronomy that treats of the physical properties of celestial bodies, such as luminosity, size, mass, density, temperature, and chemical composition. Used for geoastrophysics. *SP-7 1968*

asymptotic properties
Properties of any mathematical relation or corresponding physical system characterized by an approach to a given value as an expression, containing a variable, tends to infinity. *1984*

ATARS
Use automatic traffic advisory and resolution

atelectasis
Collapsed or airless state of all or part of the lung. *SP-7 1968*

athodyds
Use ramjet engines

atmospheric & oceanographic inform sys
A data system designed primarily for the interactive manipulation of meteorological satellite images. Capabilities include displaying, analyzing, storing, and manipulating digital data in the field of meteorology and earth resources. Used for AOIPS. *1985*

atmospheric chemistry
Study of the production, transport, modification, and removal of atmospheric constituents in the troposphere and stratosphere. *DOE 1968*

atmospheric circulation
Global or hemispheric air movements which can be treated by equations of motion in contrast to atmospheric diffusion which is small random movement not amenable to treatment by these equations. Used for wind circulation. *DOE 1968*

atmospheric cloud physics lab (Spacelab)
A NASA Spacelab mission involving cloud physics experiments in zero gravity environment. Also known as ACPL. Used for ACPL (Spacelab) and zero-g ACPL (Spacelab). *1976*

atmospheric conditions
Use meteorology

atmospheric correction
Removal of the effects of the intervening atmosphere from satellite imagery. *1983*

atmospheric electricity
Electrical phenomena, regarded collectively, which occur in the earth's atmosphere. Also the study of electrical processes occuring within the atmosphere. *SP-7 1968*

atmospheric emission
Use airglow

atmospheric entry
The penetration of any planetary atmosphere by any object from outer space; specifically, the penetration of the earth's atmosphere by a manned or unmanned capsule or spacecraft. Used for planetary entry. *SP-7 1968*

atmospheric general circulation experiment
Model experiment of the earth's atmospheric circulation as proposed for a Spacelab flight on which a liquid contained between two concentric spheres is subjected to rotation. The thermal driving force will be a stable radial temperature gradient and an unstable latitudinal gradient. *1980*

atmospheric impurities
Use air pollution

atmospheric lasers
The theoretical phenomena whereby the upper atmosphere is used as the lasing medium. *1981*

atmospheric loading
Use pollution transport

atmospheric noise
Use atmospherics

atmospheric optics
The study of the optical characteristics of the atmosphere and of the optical phenomena produced by the atmosphere's suspensoids and hydrometeors. It embraces the study of refraction, reflection, diffraction, scattering, and polarization of light, but is not commonly regarded as including the study of any other kinds of radiation. *SP-7 1970*

atmospheric pressure
The pressure at any point in an atmosphere due solely to the weight of the atmospheric gases above the point concerned. Used for barometric pressure. *SP-7 1968*

atmospheric radiation
Infrared radiation emitted by or being propagated through the atmosphere. *SP-7 1968*

atmospheric refraction
Refraction resulting when a ray of radiant energy passes obliquely through an atmosphere. *SP-7 1968*

atmospheric shells
Use atmospheric stratification

atmospheric sounding
Measurement of atmospheric phenomena generally with instruments carried aloft by spacecraft, rockets, etc. *1980*

atmospheric stratification
The presence of strata or layers in the earth's atmosphere. Used for atmospheric shells. *SP-7 1968*

atmospheric tides
Defined in analogy to the oceanic tide as an atmospheric motion on a worldwide scale, in which vertical accelerations are neglected (but compressibility is taken into account). *SP-7 1968*

atmospherics
The radiofrequency electromagnetic radiations originating, principally, in the irregular surges of charge in thunderstorm lightning discharges. Atmospherics are heard as a quasi-steady background of crackling noise (static) in ordinary amplitude modulated radio receivers. Used for atmospheric noise and *sferics.* *SP-7 1968*

atomic clocks
Timekeeping devices controlled by the frequency of the natural vibrations of certain atoms. *SP-7 1968*

atomic mass
Use atomic weights

atomic weights
The weight of an atom according to a scale of atomic weight units, awu, valued as one-twelfth the mass of the carbon atom. Used for atomic mass. *SP-7 1971*

attenuation
Reducing in intensity. *SP-7 1969*

attenuation coefficients
A measure of the space rate of attenuation of any transmitted electromagnetic radiation. *SP-7 1968*

attenuators
Devices for measuring attenuation. They are usually calibrated in dB (decibels). *ASTM (E 500, E-7) 1968*

attitude (inclination)
The position or orientation of an aircraft, spacecraft, etc., either in motion or at rest, as determined by the *relationship between its* axes and some reference line or plane or some fixed system of reference axes. Used for spatial orientation, tilt, and tilting. *SP-7 1968*

attitude control
The regulation of the attitude of an aircraft, spacecraft, etc. Also a device or system that automatically *regulates and corrects* attitude, especially of a pilotless vehicle. *SP-7 1968*

attitude gyros
Gyro-operated flight instruments that indicate the attitude of an aircraft or spacecraft with respect to a reference coordinate system throughout 360 degrees of rotation about each axis of the craft. *SP-7 1968*

audio data
Useful information at audio signal frequency. *1984*

audio frequencies
Frequencies corresponding to normally audible sound waves. *SP-7 1968*

audio signals
Signals with a bandwidth of less than 20 kilohertz. *1984*

auditory sensation areas
In acoustics, the frequency region enclosed by the curves defining the threshold of pain and *the threshold of audibility.* *SP-7 1968*

aufeis (ice)
Icing of ground or river water in Arctic areas with continuous permafrost on which the water has continued to flow. *1980*

auroral activity
Use auroras

auroral zones
Roughly circular bands around either geomagnetic pole above which there is a maximum of auroral activity. The zones lie about 10deg. to 15 deg. of geomagnetic latitude from the geomagnetic poles. *SP-7 1968*

auroras
Sporadic radiant emissions from the upper atmosphere over middle and high latitudes. Used for auroral activity and polar auroras. *SP-7 1968*

austenite
A solid solution of carbon in gamma-iron. *DOE 1968*

austenitic stainless steels
Steels having at room temperature a microstructure consisting, at least predominantly, of austenite. Their austenitic microstructure is attained above all by alloying conditions, e.g., manganese and nickel. *DOE 1968*

autocollimators
Use collimators

autocorrelation
In statistics, the simple linear internal correlation of members of a time series (ordered in time or other domains). *SP-7 1968*

automated en route ATC
An air traffic control technology which allows computers to make decisions about conflict resolution, the generation of clearances, and their automatic transmission, with the operator standing by to take over in an emergency. *1981*

automated guideway transit vehicles
A system of a large number of captive vehicles traveling at relatively close headways on an exclusive guideway controlled by a computer. Used for AGT. *1979*

automated mixed traffic vehicles
Low speed, surface vehicles automatically operated and controlled in a pedestrian environment by following a buried wire in the roadways sensing obstacles and stopping at predetermined spots for passenger exit and entry. Used for AMTV. *1978*

automated pilot advisory system
An airport advisory system and an air traffic advisory system designed to improve airport and air traffic advisories at high density uncontrolled airports. *1981*

automated radar terminal system
Radar tracking system for use in a terminal area. Primary and secondary radar targets are detected and data for the two are correlated for transmission to a central computer. *1980*

automatic control
Control of devices and equipment, including aerospace vehicles by automatic means. Used for self regulating. *SP-7 1968*

automatic data processing
Use data processing

automatic frequency control
An arrangement whereby the frequency of an oscillator is automatically maintained within specified limits. Used for AFC (control). *SP-7 1968*

automatic gain control
A process by which gain is automatically adjusted as a function of input or other specified parameter. Used for AGC (control). *SP-7 1968*

automatic pilots
Equipment which automatically stabilizes the attitude of a vehicle about its pitch, roll, and yaw axes. Used for autopilots. *SP-7 1968*

automatic rocket impact predictors
Use computerized simulation

automatic traffic advisory and resolution
Ground based collision avoidance system using the surveillance and data link capabilities of the discrete address beacon system (DABS). Used for ATARS. *1980*

automatic weather stations
Weather stations at which the services of observers are not required. They are usually equipped with telemetric apparatus. *1976*

autonomous spacecraft clocks
Standard Time scale instruments aboard spacecraft with provisions for synchronization with existing satellite-based system (global positioning system, for example). *1980*

autopilots
Use automatic pilots

autotrophs
Organisms capable of synthesizing organic nutrients directly from simple inorganic substances such as carbon dioxide and inorganic nitrogen. *DOE 1968*

autumn
The season of the year between summer and winter. Its beginning is marked by the autumnal equinox and its end by the winter solstice. *1985*

aviation meteorology
Weather conditions and meteorological studies pertaining to aeronautics. *1987*

awards
Distinctions that are bestowed upon a person or persons due to their special contributions to a field. *1982*

AXAF
Use X Ray Astrophysics Facility

axes (coordinates)
Use coordinates

axial modes
Regimes of vibration along a given axis. *1981*

axial strain
Linear strain in a plane parallel to the longitudinal axis of the specimen. Used for axisymmetric deformation and uniaxial strain. *ASTM (E 6, E-28) 1968*

axisymmetric deformation
Use axial strain

azimuth
Horizontal direction or bearing. Used for solar azimuth. *SP-7 1968*

azoles
Compounds that contain a five-membered heterocylic ring containing one or more nitrogen atoms. *DOE 1968*

B

B-A-W devices
Use bulk acoustic wave devices

babbitt metal
Any of the white alloys composed primarily of tin or lead and of lesser amounts of antimony, copper, and other metals, and used for bearings. *1976*

background noise
In recording and reproducing, the total system noise independent of whether or not a signal is present. The signal is not to be included as part of the noise. In receivers, the noise in the absence of signal modulation on the carrier. *SP-7 1968*

backings
Use backups

backups
Items kept available to replace items which fail to perform satisfactorily. Items under developement intended to perform the same general functions of another item also under development performs. Used for backings. *SP-7 1968*

backward differencing
A method of solving a parabolic problem for approximating a time derivative in terms of a previous time step. *1982*

backward facing steps
A step structure which faces an oncoming flow. Used for rearward facing steps. *1982*

backward waves
In traveling wave tubes, waves whose group velocity is opposite to the direction of electron-stream motion. *SP-7 1968*

bactericides
Agents that destroy microorganisms.
Used for germicides. *DOE 1968*

baffles
Plates that regulate the flow of a fluid, e.g., a heat exchanger, boiler flue, or automotive muffler. *DOE 1968*

bakeout
Use degassing

balanced amplifiers
Use push-pull amplifiers

ball lightning
A relatively rare form of lightning, consisting of a reddish, luminous ball, of the order of one foot in diameter, which may move rapidly along solid objects or remain floating in midair. Hissing noises emanate from such balls, and they sometimes explode noisily but may also appear noiselessly. *SP-7 1973*

ballistic cameras
Ground-based cameras using multiple exposures on the same plate to record the trajectories of rockets. *SP-7 1968*

ballistic missiles
Missiles designed to operate primarily in accordance with the laws of ballistics. *SP-7 1968*

ballistic trajectories
Trajectories followed by a body being acted upon only by gravitational forces and the resistance of the medium through which it passes. *SP-7 1968*

ballistics
The science that deals with the motion, behavior and effects of projectiles, especially bullets, aerial bombs, rockets or the like; the science or art of designing and hurling projectiles so as to achieve a desired performance. *SP-7 1968*

bandgap
Use energy gaps (solid state)

bandpass filters
Wave filters having a single transmission band; neither of the cut-off frequencies being zero or infinity. *ASTM (E268, E-21) 1968*

bang-bang control
Use off-on control

Barany chair
A kind of chair in which a person is revolved to test his susceptibility to vertigo. It is named after the Swedish physician Robert Barany who lived from 1876 to 1936. *SP-7 1968*

barchans
Use dunes

baroclinic instability
Hydrodynamic instability arising from the existence of a meridional temperature gradient (and hence a thermal wind) in an atmosphere in quasigeostrophic equilibrium and possessing static stability. *1980*

baroclinity
The state of stratification in a fluid in which surfaces of constant pressure (isobaric) intersect surfaces of constant density (isoteric). The number, per unit area, of isobaric-isoteric solenoids intersecting a given surface is a measure of baroclinity. *SP-7 1968*

barometers
Instruments used to measure atmospheric pressure. *SP-7 1968*

barometric pressure
Use atmospheric pressure

barotropism
The state of a fluid in which surfaces of constant density (or temperature) are coincident with surfaces of constant pressure; it is the state of zero baroclinity. *SP-7 1968*

barred galaxies
Spiral galaxies whose nuclei are in the shape of bars at the ends of which the spiral arms begin. About one fifth of all spiral galaxies are barred spirals. *1978*

barricades
Use barriers

barrier injection transit time diodes
Use Barritt diodes

barriers
Any materials limiting passage through itself of solids, liquids, semisolids, gases, or forms of energy such as ultraviolet light. Used for barricades and obstacles. *ASTM (F 17, F-2) 1968*

Barritt diodes
Barrier injection transit time diodes that operate similarly to IMPATT diodes. The operating frequencies are determined by the transit times across the drift. Used for barrier injection transit time diodes. *1980*

barycenter
Use center of gravity

baryon resonance
An anomaly found in scattering cross sections indicating the existence of an unstable, excited state baryon. *1968*

base flow
Fluid flow at the base or extreme aft end of a body. *1968*

base pressure
In aerodynamics, the pressure exerted on the base, or extreme aft end, of a body, as of a cylinderical or boattailed body or of a blunt-trailing-edge wing, in a fluid flow. *SP-7 1968*

bathymeters
Instruments that measure the ocean depths and check the topography of the ocean floor. Used for bathymetry. *DOE 1968*

bathymetry
Use bathymeters

bauxite
A farruginous aluminium hydroxide rock consisting of several minerals. It is the principle source for aluminum. *DOE 1968*

Bayard-Alpert ionization gages
Ionization vacuum gages using a tube with an electrode structure designed to minimize x ray induced electron emission from the ion collector. *SP-7 1968*

beacons
Lights, groups of lights, electronic apparatus, or other devices that guide, orient, or warn aircraft, spacecraft, etc. in flight.
SP-7 1968

beam currents
Currents incident on specimens by primary particle sources.
ASTM (E673, E-42) 1968

beam injection
The introduction of a particle radiation beam into a plasma or ionized gas for the purpose of diagnostics, plasma control, or the study of beam/plasma interactions. *1980*

beam interactions
A general term for interactions between various types of beams with each other or with plasmas or substances. *1981*

beam neutralization
Neutralization that takes place by means of charge exchange with a neutral gas. *1981*

beam rider guidance
System for guiding aircraft, spacecraft, or missiles, along a desired path by means of a radar beam, light beam, etc. The center of the beam axis forms a line along which the vehicle senses its location and corrects its course relative to the beam axis. *1977*

beam splitters
Partially reflecting mirrors which permit some incident light to pass through and reflect the remainder. *SP-7 1968*

beat
Use synchronism

beat frequencies
The frequencies obtained when two simple harmonic quantities of different frequencies f1 and f2 are superimposed. The beat frequency equals f1-f2. *SP-7 1968*

Beech 99 aircraft
Light, low-wing aircraft manufactured by Beechcraft. *1977*

behavior
The way in which an organism, organ, body, or substance acts in an environment or responds to excitation, as the behavior of steel under stress, or the behavior of an animal in a test. *SP-7 1968*

Bell 214A helicopter
Sixteen-seat utility helicopter. *1980*

bellows
Mechanical structures with walls like those of an accordion.
DOE 1968

bend tests
Ductility tests in which specimens are bent through an arc of known radius and angle. *1985*

bends (physiology)
Use decompression sickness

Bernoulli equation
Use Bernoulli theorem

Bernoulli theorem
In aeronautics, a law or theorem stating that in a flow of incompressible fluid the sum of the static pressure and the dynamic pressure along a streamline is constant if gravity and frictional effects are disregarded. It is named for Daniel Bernoulli, a Swiss scientist who lived from 1700 to 1782. Used for Bernoulli equation. *SP-7 1968*

BESS (satellite)
A proposed NASA primate biomedical experiment scientific satellite that was never developed. Used for biomedical experiment scientific satellite. *1977*

beta factor
In plasma physics, the ratio of the plasma kinetic pressure to the magnetic pressure. *1980*

beta interactions
Use weak interactions (field theory)

betatrons
Particle accelerators in which magnetic induction is used to accelerate electrons. *SP-7 1968*

bias
A constant or systematic error as opposed to a random error. It manifests itself as a persistent positive or negative deviation of the method average from the accepted reference value.
ASTM (E 180, E-15) 1968

bifurcation (biology)
The separation or branching into two parts, areas, aspects or connected segments, of anatomical systems or functions. *1978*

bimetric theories
Theories of gravitation. *1980*

binary codes
Codes composed of a combination of entities each of which can assume one of two possible states. Each entity must be identifiable in time or space. *SP-7 1969*

binary stars
Systems of two stars revolving about a barycenter. *SP-7 1968*

bioassay
A standardized procedure for the determination of the effects of an environmental variable or substance on living organisms. Used for biological analysis. *ASTM (D 1129, D-19) 1968*

bioastronautics
The study of biological, behavioral, and medical problems pertaining to astronautics. This includes systems functioning in the environments expected to be found in space, vehicles designed to travel in space, and the conditions on celestial bodies earth.
SP-7 1968

biochemical oxygen demand
The amount of oxygen necessary for the oxidative decomposition of a material by microorganisms. The amount of oxygen consumed in mg/1 of water (or waste water) over a period of 5 days at 20 deg. C under laboratory conditions. Used for BOD. *DOE 1976*

biochemistry
Chemistry dealing with the chemical processes and compounds of living organisms. *SP-7 1968*

biocompatibility
Compatibility of substances with living tissues and blood components. *1980*

bioconversion
The transformation of algae and/or other biomass materials in successive stages to aliphatic organic acids to aliphatic hydrocarbons to diesel and/or other liquid fuels. *1980*

biodegradability
The characteristic of a substance that can be decomposed by microorganisms. *1977*

biodynamics
The study of the effects of dynamic processes (motion, acceleration, weightlessness, etc.) on living organisms. Used for biomechanics. *SP-7 1968*

biofeedback
Originally confined to the presenting of a subject with sensory information about his ongoing physiological activities, it now includes the controlling of specific physiological activities through trained mental effort. *1983*

biological analysis
Use bioassay

biological models
Use bionics

biological models (mathematics)
Mathematical models for living systems. *1980*

biomagnetism
Magnetic fields surrounding parts or the whole of a living biological system; also, the effects of magnetism on parts or the whole of a biological entity. *1977*

biomass
The dry weight of living matter in a given area expressed in terms of mass or weight per unit of volume or area. *1985*

biomechanics
Use biodynamics

biomedical experiment scientific satellite
Use BESS (satellite)

bionics
The study of systems, particularly electronic systems, which function after the manner characteristic of, or resembling living systems. Used for biological models and biosimulation. *SP-7 1968*

bioreactors
Biological processors to remove or produce certain chemicals or a particular chemical. *1981*

bioregenerative life support systems
Use closed ecological systems

biosatellites
Artificial satellites which are specifically designed to contain and support man, animals, or other living material in a reasonably normal manner for a adequate period of time and which, particularly for man and animals, posesses the proper means for safe return to the earth. *SP-7 1968*

biosimulation
Use bionics

biosphere
That transition zone between earth and atmosphere within which most forms of terrestrial life are commonly found; the outer portion of the geosphere and inner or lower portion of the atmosphere. *SP-7 1976*

Biot number
A standard heat transfer dimensionless number. *1985*

biotechnology
The application of engineering and technological principles to the life sciences. *SP-7 1968*

biotelemetry
The remote sensing and evaluation of life functions, as, e.g., in spacecraft and artificial satellites. Used for physiological telemetry. *SP-7 1968*

biotite
A widely distributed and important rock-forming mineral of the mica group. Used for kimberlite. *DOE 1968*

bipolarity
Capability of assuming negative or positive values. *1981*

bipropellants
Use liquid rocket propellants

birefringence
A double-refraction phenomenon in which an unpolarized beam of light is divided into two beams with different directions and relative velocities of propagation. The amount of energy transmitted along an optical path through a crystal which exhibits birefringence becomes a function of crystalline orientation. Used for Pockels effect. *ASTM (F 120, F-1) 1968*

bistable amplifiers
Use flip-flops

bistatic radar
Use multistatic radar

bistatic reflectivity
The characteristic of a reflector which reflects energy along a line, or lines, different from, or in addition to, that of the incident ray. *SP-7 1968*

bit error rate
The number of erroneous bits or characters received from some fixed number of bits transmitted. *1983*

bitumens
Dark-colored (solid, semisolid, or viscous) cementitious substances, natural or manufactured, composed principally of high molecular weight hydrocarbons, of which asphalts, tars, pitches, and asphaltenes are typical. *ASTM (D 8, D-4) 1968*

BL lacertae objects
One of a class of astronomical objects exhibiting; (1) rapid variations in intensity at radio, infrared, and optical wavelengths; (2) energy distributions largely at infrared wavelengths; (3) absence of discrete features in low dispersion spectra; and (4) strong and rapidly varying polarization at visual and radio wavelengths. *1978*

black body radiation
The electromagnetic radiation emitted by an ideal black body; it is the theoretical maximum amount of radiant energy of all wavelengths which can be emitted by a body at a given temperature. *SP-7 1968*

Black Hawk assault helicopter
Use H-60 Helicopter

blade slap noise
Impulsive noise (short high pressure sound waves) of rotating blades primarily helicopter blades. Used for helicopter impulsive noise. *1981*

blades
Arms of propeller and rotating wings. Specifically, restrictive, those parts of propellers or of rotating wings from the shank outward, i.e. those parts having efficient airfoil shapes and that cleave the air. Vanes such as rotating vanes or stationary vanes in rotary air compressors, or vanes of turbine wheels. *SP-7 1968*

blankets (fission reactors)
Damper materials for fission reactors. *1979*

blankets (fusion reactors)
Damper materials for fusion reactors. *1979*

blast deflectors
Devices used to divert the exhaust of a rocket fired from a vertical position. *SP-7 1968*

bloedite
A mineral consisting of hydrous sodium mangnesium sulfate that is colorless. Also known as astrakanite or astrochanite. *1978*

blood-brain barrier
A mechanism which maintains the constancy of the neurons in the central nervous system by preventing certain substances from leaving the bloodstream and entering the neural tissue. *1980*

blue stars
Stars of spectral type O, B, A, or F according to the Draper catalog. *1981*

bluff bodies
Bodies having a broad, flattened front, as in some rentry vehicles. *SP-7 1968*

blunt leading edges
The obtuse cross sections of certain front edges of airfoils or wings. *1976*

blunt trailing edges
The rounded or obtuse angled trailing edges of wings and/or control surfaces designed to enhance aerodynamic characteristics. *1979*

boattails
The rear portions of elongated bodies, as in rockets, having decreasing cross-sectional area toward the rear. *SP-7 1968*

BOD
Use biochemical oxygen demand

bodies of revolution
Symmetrical bodies having the form described by rotating a plane curve about an axis in its plane. *SP-7 1968*

body temperature (non-biological)
Use temperature

body temperature regulation
Use thermoregulation

Boeing 757 aircraft
Boeing's twin turbofan short/medium range transport aircraft that made its first flight on February 19, 1982. *1980*

Boeing 767 aircraft
Boeing's widebodied medium range commercial transport aircraft that made its first flight on September 26, 1981. *1980*

bogs
Use marshlands

Bohr magneton
A constant equivalent to the magnetic moment of an electron. *SP-7 1970*

bolides
Brilliant meteors, especially ones which explode; detonating fireballs. *SP-7 1968*

bolograms
Use bolometers

bolometers
Instruments which measure the intensity of radiant energy by employing thermally sensitive electrical resistors; a type of actinometer. Used for bolograms. *SP-7 1968*

bolted joints
Joints fastened with bolts. They are usually designed for heavy loads. *1987*

bombs (ordnance)
Explosive devices designed to be detonated under specified conditions. *DOE 1968*

bonding
Specifically, a system of connections between all metal parts of an aircraft or other structure forming a continuous electrical unit and preventing jumping or arching of static electricity. Glueing or sementing together for structural strength. *SP-7 1968*

Bonne projection
A type of conical map projection in which meridians are plotted as curves and the parallels are spaced along them at true distances. *1980*

Boolean algebra
The study of the manipulation of symbols representing operations according to the rules of logic. Boolean algebra corresponds to an algebra using only the numbers 0 and 1, therefore can be used in programming digital computers which operate on the binary principle. *SP-7 1968*

boost
Use acceleration (physics)

boostglide vehicles
Vehicles designed to glide in the atmosphere following a rocket-powered phase. Portions of the flights may be ballistic, out of the atmosphere. *SP-7 1968*

boreholes
Holes made by drilling into the ground to study stratification, to search for or to obtain natural resources, or to release underground pressures. *1980*

boresight error
Linear displacement between two parallel lines of sight. *1980*

boron fibers
Fibers produced by vapor deposition methods; used in various composite materials to impart a balance of strength and stiffness. *1979*

borosilicate glass
Low expansion heat resistant glass. Used for Pyrex (trademark). *DOE 1968*

Borsic (tradename)
Trademark of United Aircraft Products, Inc. for its boron aluminum composite materials. *1980*

Bouguer law
A relationship describing the rate of decrease of flux density of a plane-parallel beam of monochromatic radiation as it penetrates a medium which both scatters and absorbs at that wavelength. Used for Lambert law. *SP-7 1968*

boundary element method
Technique for solving two-and three-dimensional boundary value problems in thermodynamics, mechanics, etc. *1981*

boundary integral method
Technique related to the boundary element method, and used for laminar and turbulent flow problems. *1981*

boundary layer plasmas
Plasmas resulting from the frictional heat of hypersonic spacecraft entering the earth's atmosphere. *1976*

boundary value problems
Physical problems completely specified by a differential equation in an unknown, valid in a certain region of space, and certain information (boundary condition) about the unknown, given on the boundaries of that region. The information required to determine the solution depends completely and uniquely on the particular problem. Used for initial value problems and point matching method (mathematics). *SP-7 1968*

Boussinesq approximation
The assumption (frequently used in the theory of convection) that the fluid is incompressible except insofar as the thermal expansion produces a buoyancy. *SP-7 1968*

bow shock waves
Use bow waves
shock waves

bow waves
Shock waves in front of a body, such as an airfoil, or apparently attached to the forward tip of the body. Used for bow shock waves. *SP-7 1968*

Bragg angle
The angle between the incident beam and the lattice planes considered. *ASTM (E 7, E-4) 1968*

Bragg curve
A curve showing the average specific ionization of an ionizing particle of a particular kind as a function of its kinetic energy, velocity, or residual range. *1981*

braille
A system of writing that uses characters made up of raised dots. It was named after Louis Braille. *1981*

Brayton cycle
A thermodynamic cycle consisting of two constant-pressure processes interspersed with two constant-antropy cycles. Named after George B. Brayton, American engineer. *DOE 1968*

Brazilian space program
The space program of Brazil which is under the jurisdiction of the Instituto de Pesquisas Espaciais (INPE). *1982*

breadboard models
Assemblies of preliminary circuits or parts used to prove the feasibility of a device, circuit, system, or principle without regard to the final configuration or packaging of the parts. *SP-7 1968*

bremsstrahlung
Electromagnetic radiation produced by the rapid change in the velocity of an electron or another fast, charged particle as it approaches an atomic nucleus and is deflected by it. In German it means braking radiation. *SP-7 1968*

bricks
Solid masonry units of clay or shale, usually formed into a rectangular prism while plastic and burned or fired in a kiln. Bricks are ceramic products. *ASTM (C 43, C-15) 1968*

brightness
The attribute of visual perception in accordance with which an area appears to emit more or less light. *SP-7 1968*

brightness distribution
The statistical distribution based on brightness, or the distribution of brightness over the surface of an object. *1981*

brightness temperature
In astrophysics, the temperature of a black body radiating the same amount of energy per unit area at the wavelengths under consideration as the observed body. The temperature of a nonblack body determined by measurement with an optical pyrometer. *SP-7 1970*

brines
Water saturated or strongly impregnated with common salt. *DOE 1968*

broken symmetry
Phenomena where a loss of symmetry is present such as in piezoelectricity. Used for symmetry breaking. *1981*

Brunt-Vaisala frequency
The frequency at which an air parcel will oscillate when subjected to an infinitesimal peturbation in a stably stratified atmosphere. *1983*

brushes (electrical contacts)
Conductive metal or carbon blocks used to make sliding electrical contact with a moving part as in an electric motor. *1976*

bubbles
Internal voids or trapped globules of air or other gas.
ASTM (C 582, C-3) 1968

buckling
An unstable state of equilibrium of a thin-walled body stemming from compressive stresses in walls. The lateral deflection of a thin-walled body resulting from such instability. *SP-7 1968*

buffer storage
In computer operations, storage used to compensate for a difference in rate of flow or time of occurence when transferring information from one device to another. *SP-7 1968*

buffeting
The beating of an aerodynamic structure or surfaces by unsteady flow, gusts, etc.; the irregular shaking or oscillation of a vehicle component owing to turbulent air or separated flow. *SP-7 1968*

building structures
Use buildings

buildings
Structures erected and framed of component structural members designed for the housing, shelter or support of persons, animals, or property. Used for building structures.
ASTM (E 683, E-44) 1968

bulk acoustic wave devices
Acoustooptic devices utilizing bulk sound waves at megahertz frequencies in thin film transducers. Used for B-A-W devices. *1979*

bulk modulus
The reciprocal of the coefficient of compressibility. *SP-7 1968*

bulkheads
Steep or vertical structures supporting natural or artificial embankments. *ASTM (A 700, A-1) 1968*

bumpy toruses
The shapes (doughnuts) of certain plasmas. *1980*

burning
Use combustion

burning process
Use combustion

burning rate
The velocity at which a solid propellant in a rocket is consumed. The symbol is r. *SP-7 1968*

burnout
The termination of combustion in a rocket engine because of exhaustion of the propellant. *1968*

butylene oxides
Use tetrahydrofuran

bypass ratio
Ratio of the secondary to the primary inlet airflows for a turbofan engine. *1981*

C

C-M diagram
Use color-magnitude diagram

C-8A augmentor wing aircraft
NASA's research, short haul, jet aircraft. *1977*

CAD (design)
Use computer aided design

cadmium mercury tellurides
Use mercury cadmium tellurides

calderas
Large, basin-shaped volcanic depressions, more or less circular in form, the diameter of which is many times greater than that of the included vent or vents. *DOE 1971*

calendars
Orderly arrangements of days, weeks, months, etc. to suit a particular need such as civil life. *SP-7 1969*

Callisto
A satellite of Jupiter orbiting at a mean distance of 1,884,000 kilometers. Also called Jupiter IV. *SP-7 1976*

calorimeters
Instruments designed to measure heat evolved or absorbed. Used for microcalorimeters. *SP-7 1968*

CAM (manufacturing)
Use computer aided manufacturing

Canadian space program
Space research, programs, and activities undertaken by Canada. *1980*

Canadian spacecraft
Spacecraft of the Canadian Government. The following satellites have been developed: Alouette satellites, ISIS satellites, Anik satellites, and Hermes satellite. RADARSAT and MSAT are in the process of being developed. *1983*

canard configurations
Pertaining to an aerodynamic vehicle in which horizontal surfaces used for trim and control are forward of the main lifting surface; the horizontal trim and control surfaces in such an arrangement. *SP-7 1968*

canopies (vegetation)
The topmost layers of leaves and branches of forest trees or other plants. *1980*

capacitance
That property of a system of conductors and dielectrics which permits the storage of electrically seperated charges when potential differences exist between the conductors. It is the ratio of a quantity, Q, of electricity to a potential difference, V. A capacitance value is always positive. The units are farads when the charge is expressed in coulombs and the potential in volts: $C = Q/V$. Capacitance is symbolized as C.*ASTM (D 150, D 1711; D-4) 1968*

capacitance-voltage characteristics
The characteristics of a metal semiconductor contact or a semiconductor junction that manifests a measured capacitance as a function of a dc bias voltage with small, superimposed ac voltage applied to that junction or contact. *1985*

capsules (spacecraft)
Use space capsules

captive tests
Holddown tests of a propulsive subsystem, rocket engine or motor as distinguished from a flight test. *SP-7 1968*

capture cross sections
Use absorption cross sections

capture effect
An effect in frequency-modulation (FM) reception where the stronger signal of two stations on the same frequency completely surpresses the weaker signal. *SP-7 1968*

carbenes
An organic radical containing divalent carbon. *DOE 1968*

carbides
Compounds of carbon with one or more metallic elements. *SP-7 1968*

carbon cycle
The path of carbon in living beings in which carbon dioxide is fixed by photosynthesis to form organic nutrients and ultimately restored to the inorganic state by respiration and protoplasmic decay. *1980*

carbon suboxides
Colorless lacrimatory gases having unpleasant odors and boiling points of approximately -7 degrees C. *1977*

carbonaceous materials
Substance composed of or containing carbon or carbon compounds. *1978*

carburizing
Introducing carbon into a solid ferrous alloy by holding above Ac1 in contact with a suitable carbonaceous material. The carborized alloy is usually quench hardened. *ASTM (E 44, E-4) 1968*

carcinogens
Agents producing or inciting cancerous growth. *ASTM (E 609, E-35) 1968*

cardiovascular system
The system of an animal pertaining to the heart and blood vessels. Used for vascular system. *SP-7 1968*

Caribbean region
The region that consists of all or parts of the islands of the Caribbean Sea, the Bahamas, the British dependent territories, the Virgin Islands, and the mainland areas of the three Guianas and Belize. *1984*

Carnot cycle
An idealized reversible thermodynamic cycle. The carnot cycle consists of four stages: (a) an isothermal expansion of the gas at temperature T1; (b) an adibiatic expansion to temperature T2; (c) an isothermal compression at temperature T2; (d) an adiabatic compression to the original state of the gas to complete the cycle. *SP-7 1968*

carrier density (solid state)
The charge carrier concentrations of holes and/or electrons in a semiconductor which determines its electronic characteristics and function. *1979*

carrier modulation
Use modulation

carrier to noise ratios
RF signal power input to the receiver divided by the noise power input. *1981*

carrier transport (solid state)
The mobility of conduction electrons or holes in semiconductors. *1980*

carrier waves
Waves generated at a point in the transmitting system and modulated by the signal. Used for subcarrier waves. *SP-7 1968*

Cartesian coordinates
A coordinate system in which the locations of points in space are expressed by reference to three planes, called coordinate planes, no two of which are parallel. Used for rectangular coordinates. *SP-7 1968*

cartridge actuated devices
Use actuators

catapults
A power-actuated machine or device for hurling forth something, as an airplane or missile, at a high initial speed; also a device usually explosive, for ejecting a person from an aircraft. *SP-7 1968*

cathode ray tubes
Vacuum tubes consisting essentially of an electron gun producing a concentrated electron beam (or cathode ray) which impinges on a phosphorescent coating on the back of a viewing face (or screen). The excitation of the phosphor produces light, the intensity of which is controlled by the flow of electrons. Deflection of the beam is achieved either electromagnetically by currents in coils around the tube, or electrostatically by voltages on internal deflection plates. *SP-7 1968*

cathodes
In electron tubes, electrodes through which a primary stream of electrons enters the interelectrode space. *SP-7 1968*

cathodic coatings
Material forming a continuous film on a base metal by mechanical coating or by electroplating. *1980*

cathodoluminescence
Luminescence produced when high velocity electrons bombard a metal in a vacuum, thus vaporizing small amounts of the metal which, in an excited state, emit radiation characteristic of the metal. *1985*

cations
Positively-charged ions. *ASTM (B 374, B-8; G 15, G-1) 1968*

CATT devices
Controlled avalanche transit time triodes which use avalanche multiplication in the collector depletion region of a silicon, bipolar, transistor-like structure to increase the gain and thereby achieve a higher frequency operation of silicon bipolar transistos. Used for controlled avalanche transit time devices. *1981*

caulking
Material ranging in physical characteristics from plastic to solid to preformed. Used to seal and waterproof joints and overlaps in structures, other assemblies or portions thereof where movement may occur. *ASTM (C 460, C-17) 1968*

caustic lines
The locations of wave front interactions induced by the maneuvers of supersonic aircraft in changing direction and/or attitude. *1980*

caustics (optics)
The envelope of rays diffracted by surface defects in materials. *1980*

cavitation
Use cavitation flow

cavitation flow
The formation of bubbles in a liquid, occurring whenever the static pressure at any point in the fluid flow becomes less than the fluid vapor pressure. Used for cavitation and gaseous cavitation. *SP-7 1968*

cavitons
Density cavities created by localized oscillating electric fields. *1982*

CCD
Use charge coupled devices

CCD star tracker
Navigation instrument designed for the NASA space transportation system. Used for stellar (star tracker). *1977*

CDMA
Use code division multiple access

celestial bodies
Any aggregations of matter in space constituting a unit for astronomical study, as the sun, moon, a planet, comet, star, or nebula. Also called heavenly bodies. *SP-7 1968*

celestial geodesy
The determination of the form of the earth, of the earth's gravitational field, and of relative positions of satellite trajectories. *1968*

celestial mechanics
The study of the theory of motions of celestial bodies under the influence of gravitational fields. *SP-7 1968*

celestial navigation
The process of directing a craft from one point to another by reference to celestial bodies of known constants. *SP-7 1968*

celestial observation
Use astronomy

celestial sphere
An imaginary sphere of infinite radius concentric with the earth, on which all celestial bodies except the earth are assumed to be projected. *SP-7 1968*

cellulose
The carbohydrate that is the principal constituent of wood and forms of structural framework of the wood cells. *ASTM (D 9, D-7) 1968*

cementite
An intermetallic compound containing iron and carbon. *DOE 1968*

center of gravity
The center of mass of a system of masses, as the barycenter of the earth-moon system. Used for barycenter. *SP-7 1968*

center of mass
A point of a material body or system of bodies which moves as though the system's total mass existed at that point and all external forces were applied at the point. *1978*

centimeter waves
Electromagnetic radiation in the 3,000 to 30,000 MHz range. *1977*

centrifugal force
The apparent force in a rotating system, deflecting masses radially from the axis or rotation. *SP-7 1968*

centrifuges
Specifically in aerospace, large motor driven apparatus with long arms at the end of which human and animal subjects or equipment can be revolved and rotated at various speeds to simulate (very closely) the (prolonged) accelerations in high performance aircraft, rockets, and spacecraft. Sometimes called astronautic centrifuges. Used for cyclones (equipment). *SP-7 1968*

cepstra
The Fourier transformation of the logarithm of the power spectrum. *1976*

cepstral analysis
The application of cepstral methods to wave or signal phenomena in seismology, speech analysis, echos, underwater acoustics, etc. *1976*

ceramal protective coatings
Use cermets

ceramals
Use cermets

ceramic fibers
Fibers composed of ceramic materials. They are usually used for reinforcement. *1965*

ceramic matrix composites
Composite materials consisting of a reinforced ceramic matrix. *1983*

ceramics
Inorganic compounds or mixtures requiring heat treatment to fuse them into homogeneous masses usually posessing high temperature strength but low ductility. Types and uses range from china for dishes to refractory liners for nozzles. *SP-7 1968*

Cerenkov effect
Use Cerenkov radiation

Cerenkov radiation
The radiation from a charged particle whose velocity is greater than th phase velocity that an electromagnetic wave would have if it were propagating in the medium. The particle will continue to lose energy by radiation until its velocity is less than this phase velocity. Used for Cerenkov effect. *SP-7 1968*

cermets
Bodies consisting of ceramic particles bonded with a metal; used in aircraft, rockets, and spacecraft for high strength, high temperature applications. The name is derived from a combination of CERamic and METal. Used for ceramal protective coatings and ceramals. *SP-7 1968*

Cessna 402B aircraft
A lighter, twin-engine, short-haul cargo/passenger aircraft manufactured by the Cessna Aircraft Company. *1976*

CFD
Use charge flow devices

Chandler motion
Use polar wandering (geology)

change detection
A process of examining imagery to detect changes on a planetary surface or astronomical body. *1984*

channel noise
In communications bursts of interruptive pulses caused mainly by contact closures in electromagnetic equipment or by transient voltages in electric cables during transmission of signals or data. Impulsive noise is the frequent cause of transmission errors. *1980*

Chapman-Jouget flame
Use detonation

characteristics
Specifically, distinguishing qualities, properties, features or capabilities of an entity. *SP-7 1968*

charge coupled devices
Semiconductor devices arrayed so that the electric charge at the output of one provides the input stimulus to the next. Use for CCD. *DOE 1974*

charge efficiency
The efficiency of electric cell recharging. *1980*

charge exchange
The collisional transfer of an electron from a neutral atom or molecule to an ion. *1968*

charge flow devices
Metal oxide semiconductor (MOS) devices used for fire detectors and humidity sensors. Used for CFD. *1978*

charm (particle physics)
A quantum number which has been proposed to account for an apparent lack of symmetry in the behavior of hadrons relative to that of leptons, to explain why certain reactions of elementary particles do not occur, and to account for the longevity of the J particle. *1981*

Charon
Natural satellite of the planet Pluto, discovered and named by Dr. James W. Christy. *1979*

checkout
A sequence of actions taken to test or examine a thing as to its readiness for incorporation into a new phase of use, or for the performance of its intended function. The sequence of steps taken to familiarize a person with the operation of an airplane or other piece of equipment. Used for debugging. *SP-7 1968*

chemical clouds
Artifical clouds of chemical compounds released in the ionosphere for observation of dispersion and other characteristics. *1978*

chemical defense
All actions and counteractions designed for the protection of personnel and material against offensive chemical agents. *1980*

chemical energy
Energy produced or absorbed in the process of a chemical reaction. In any such a reaction, energy losses or gains usually involve only the outermost electrons of the the atoms or ions of the system undergoing change; here a chemical bond of some type is established or broken without disrupting the original atomic or ionic identities of the constituents. *SP-7 1968*

chemical evolution
The theory of the creation or production of living matter from nonliving matter. *1976*

chemical fuels
Fuels that depend upon an oxidizer for combustion or for developement of thrust, such as liquid or solid rocket fuel or internal combustion engine fuel; distinguished from nuclear fuel. *SP-7 1969*

chemical release modules
Shuttle launched, free-flying spacecraft containing canisters for injecting chemicals into the upper atmosphere and the measurement of the reactions. *1980*

chemiluminescence
Any luminescence produced by chemical action. *SP-7 1968*

chemisorption
The binding of a liquid or gas on the surface or in the interior of a solid by chemical bonds or forces. *SP-7 1968*

chemosphere
The vaguely defined region of the upper atmosphere in which photochemical reactions take place. It is generally considered to include the stratosphere (or the top thereof) and the mesosphere, and sometimes the lower part of the thermosphere. *SP-7 1968*

Chinese spacecraft
Satellites built and launched by the Chinese Peoples Republic. *1980*

chips (electronics)
Integrated microcircuits mounted on substrates and performing significant numbers of functions. *1977*

chips (memory devices)
Integrated microcircuit devices used collectively to perform the functions of data storage: accepting, retaining, and emitting bits of data. *1977*

Chiron
Minor planet 2060, a solar system asteriod discovered by Charles T. Kowal of Hale Observatories. Used for Minor Planet 2060. *1980*

chirp
An all encompassing term for the various techniques of pulse expansion-pulse compression applied to pulse radar; a technique to expand narrow pulses to wide pulses for transmission, and compress wide received pulses to the original narrow pulse width and wave shape, to gain improvement in signal-to-noise ratio without degradation to range resolution and range discrimination. *SP-7 1968*

chitin
A polysaccharide which is the principal constituent of the shells of crabs and lobsters and of the shards of beetles. It is also found in certain fungi. *1968*

Chlorella
A genus of unicellular green algae to be adapted to converting carbon dioxide into oxygen in a closed ecological system. *SP-7 1968*

chlorocarbons
All compounds containing chlorine and carbon with or without other elements. *1985*

Cholesky factorization
A numerical algorithm used to solve linear systems of equations. *1981*

chondrites
Meteoritic stones characterized by small rounded grains or spherules. *SP-7 1968*

chords (geometry)
Straight lines intersecting circles or other curves, or straight lines connecting the ends of arcs. In aeronautics, straight lines intersecting or touching airfoil profiles at two points; specifically, those parts of lines between two points of intersections. Used for aerodynamic chords. *SP-7 1968*

chromatography
The separation of chemical substances by making use of differences in the rates at which the substances travel through or along a stationary medium. *SP-7 1968*

chromium steels
Steels containing chromium as the main alloying element. *DOE 1968*

chromosphere
A thin layer of relatively transparent gases above the photosphere of the sun. *SP-7 1968*

chronotrons
Use time lag

Chukchi Sea
Part of the Arctic Ocean north of the Bering Strait between Asia and North America. *DOE 1971*

circadian rhythms
Regular changes in physiological function occurring in approximately 24 hour cycles. Used for diurnal rhythms. *SP-7 1968*

circuits
Networks providing one or more closed paths. Used for electric circuits, exploding conductor circuits, shunts, and subcircuits. *SP-7 1968*

circular waveguides
Small hollow tubes that are designed to transmit a specific wavelength along the length of the tube. *1984*

circulation
The flow or motion of a fluid in or through a given area or volume. A precise measure of the average flow of a fluid along a given closed curve. Used for recirculation. *SP-7 1968*

circulation control airfoils
Airfoils in which a high lift capability is produced by supercirculation where control of the stagnation points by the jet sheet produces high lift coefficients. *1980*

circulation control rotors
Rotors that provide STOL capability on high performance aircraft by means of tangential blowing over a rounded trailing edge and mass flow characteristic of turbine engine bleed. *1979*

circulation distribution
The line integral of the velocity component around a curve along the closed contour. *1982*

circumsolar radiation
Radiation from small angle scattering of direct sunlight from atmospheric aerosols with dimensions on the order of or greater than the wavelength of light. *1977*

circumsolar telescopes
Optical instruments for measuring the circumsolar radiation for application to solar energy systems. Mirrors and lenses are utilized for incident sunlight concentration. *1980*

cislunar space
Of or pertaining to phenomena, projects, or activity in the space between the earth and the moon, or between the earth and the moon's orbit. *SP-7 1968*

CL-600 challenger aircraft
Canadair turbofan aircraft with supercritical wings. *1980*

cladding
A coating placed on the surface of a material and usually bonded to the material. *SP-7 1968*

clamping circuits
Circuits which maintain either extremity of a waveform at a prescribed potential. Networks for adjusting the absolute voltage level of waveforms. *SP-7 1968*

clean fuels
Energy sources from which pollutants and other impurities have been removed by refining, purification, and other means, to produce fuels less conducive to pollution. *1978*

clean rooms
Areas in which the temperature, humidity, and the airborne particulate contamination are controlled as required. *ASTM (C 859, C-26; F 318, F-7) 1968*

closed ecological systems
Systems that provide for the maintenance of life in an isolated living chamber through complete reutilization of the material available, in particular, by means of a cycle wherein exhaled carbon dioxide, urine, and other waste matter are converted chemically or by photosynthesis into oxygen, water, and food. Used for bioregenerative life support systems. *SP-7 1968*

closed faults
Use geological faults

cloud chambers
Devices for observing the paths of ionizing particles, based on the principle that supersaturated vapor condenses more readily on ions than on neutral molecules. *SP-7 1968*

cloud physics
A subdivision of physical meteorology concerned with physical properties of clouds in the atmosphere and the processes occuring therein. *SP-7 1968*

cloud seeding
Any technique carried out with the intent of adding to a natural cloud in a planetary atmosphere certain substances that will alter the natural developement of that cloud. *SP-7 1968*

cluster analysis
The analysis of data with the object of finding natural groupings within the data either by hand or with the aid of a computer. *1982*

clutter
Atmospheric noise, extraneous signals, etc. which tend to obscure the reception of a desired signal in a radio receiver, radarscope, etc. *SP-7 1968*

CMOS
The combination of a PMOS (p-type channel metal oxide semiconductor) with an NMOS (n-type channel metal oxide semiconductor). Used for complementary metal oxide semiconductors. *1977*

CN emission
Radio waves emitted from incandescent gaseous cyanide (CN) in space under low pressures at wavelengths characteristic of the elements comprising the gas. Used for cyanide emission. *1976*

cnoidal waves
Finite amplitude progressive waves in shallow water having a wave profile represented by the Jacobian elliptic function 'CN'. *1978*

coal
A brown to black combustable sedimentary rock (in the geological sense) composed principally of consolidated and chemically altered plant remains. *ASTM (D 2796, D-5) 1968*

coal derived gases
The gases which are derived from various coal gasification processes. *1981*

coal derived liquids
Fluid hydrocarbons derived from the liquefaction of coal. *1980*

coalescence
Use coalescing

coalescing
Growing of grains at the expense of the remainder by adsorption or the growth of a phase or particle at the expense of the remainder by absorption or by reprecipitation. Used for coalescence. *ASTM (E 7, E-4) 1968*

coastal dunes
Use dunes

coastal marshlands
Use marshlands

coasting flight
The flight of a rocket between burnout of thrust cutoff of one stage and ignition of another, or between burnout and summit altitude or maximum horizontal range. *SP-7 1968*

coatings
Liquid, liquefiable or mastic compositions which are converted to a solid protective, decorative, or functional adherent film after application as a thin layer. *ASTM (D 16, D-1) 1968*

coaxial cables
Waveguides consisting of two concentric conductors insulated from each other. Used for coaxial transmission. *SP-7 1968*

coaxial nozzles
Class of nozzle configurations in jet aircraft for reducing noise. *1979*

coaxial transmission
Use coaxial cables
transmission

COBE
Use Cosmic Background Explorer satellite

cobra dane (radar)
Radar installation for monitoring Soviet missiles. *1977*

code division multiple access
Multiple access system in which users are segregated by means of pseudorandom signal coding and bandwidth spreading so that the complete time and frequency axes are occupied and only the power is shared. Used for CDMA. *1979*

code division multiplexing
The separation of two or more simultaneous radio transmissions over a common path by signal coding and bandwidth spreading. *1979*

coesite
A polymorph of silicon dioxide. *DOE 1969*

Coffin-Manson law
A relationship which enables one to estimate the fatigue life from the cyclic plastic strain range. The specific life for a given metal or alloy is determined by its tensile ductility. *1981*

cogeneration
The generation of electricity or shaft power by an energy conversion system and the concurrent use of the rejected thermal energy from the conversion system as an auxiliary energy source. *1980*

coherent radar
A type of radar that employs circuitry which permits comparison of the phase of successive received target signals. *SP-7 1968*

cohesion
The mutual attraction by which elements of a substance are held together. *ASTM (C 904, C-3) 1968*

coincidence circuits
Circuits that produce a usable output only when each of two or more input circuits receive pulses simultaneously or within an assignable time interval. *SP-7 1968*

cold cathodes
Cathodes whose operation does not depend on its temperature being above the ambient temperature. *SP-7 1969*

cold drawing
Reducing the cross section (of wire) by pulling through a die or dies, at a temperature lower than the recrystallization temperature. *ASTM (B 354, B-1) 1968*

cold flow tests
Tests of liquid rockets without firing them to check of verify the efficiency of a propulsion subsystem,providing for the conditioning and flow of propellants (including tank pressurization, propellant loading, and propellant feeding). *SP-7 1968*

cold forming
Use cold working

cold neutrons
Neutrons of less velocity than thermal neutrons; at 152 deg. C their energy is below 0.01 eV. *DOE 1968*

cold working
Deforming metal plasticity at a temperature lower than the recrystallization temperature. Used for cold forming. *SP-7 1968*

collectors
Use accumulators

collimators
Optical devices which render rays of light parallel. Used for autocollimators. *SP-7 1968*

collision parameters
In orbit computation, the distances between centers of attraction of central force fields and the extension of velocity vectors of moving objects at great distances from the centers. In gas dynamics and atomic physics, any of several parameters such as cross section, collision rate, mean free path, etc. which provide a measure of the probability of collision. *SP-7 1968*

collision rates
Ratios defined by the average number of collisions per second suffered by a molecule of other particle moving through a gas. *SP-7 1968*

color (particle physics)
Use quantum chromodynamics

color coding
Any system of colors used for purposes of identification. Used for color enhancement. *1981*

color enhancement
Use color coding

color infrared photography
A representation of temperature differences using false colors. *1982*

color-color diagram
A two-axis coordinate graph showing the distribution of stars or other objects with reference to different color indices. *1987*

color-magnitude diagram
The plot of the absolute or apparent magnitude against the color index for a group of stars. Also known as C-M diagram. Used for C-M diagram. *1985*

Columbus space station
The European Space Agency's manned orbital platform. *1987*

combined cycle power generation
Power generation which combines an open-cycle gas turbine and a closed cycle steam turbine. *1981*

combustibility
Use flammability

combustion
A chemical process of oxidation that occurs at a rate fast enough to produce heat and usually light either as a glow or flames. Some oxidation such as that of hydrogen emits radiation outside the visible spectrum. Used for burning and burning process. *ASTM (D 123, D-13) 1968*

combustion chambers
Containers in which the actual burning of fuel takes place. Used for combustors. *DOE 1968*

combustion chemistry
The study of the exothermic oxidation reactions occurring immediately before and during combustion. *1985*

combustion control
Control of factors (temperature, preheating, draft, excess or deficient air, etc.) which affects combustion efficiency. *DOE 1968*

combustion efficiency
The efficiency with which fuel is burned, expressed as the ratio of the actual energy released by the combustion to the potential chemical energy of the fuel. *SP-7 1968*

combustors
Use combustion chambers

cometary atmospheres
The region of the coma of a comet as well as the gaseous part surrounding the coma that often is a hydrogen atmosphere that contains particulate matter. *1982*

comets
Luminous members of the solar system composed of a head, or coma, and often with a spectacular gaseous tail extending a great distance from the head. *SP-7 1968*

command guidance
The guidance of a spacecraft or rocket by means of electronic signals sent to receiving devices in the vehicle. Used for command systems. *SP-7 1968*

command languages
Vocabularies to interactively execute activities such as computer retrieval or input. *1982*

command systems
Use command guidance

commercial spacecraft
Commercial satellites and other spacecraft operated by the private sector. *1984*

commonality
The factors which are common in equipment or systems. *1984*

communication networks
Organization of facilities for the rapid reception of, transmission of, and/or relaying of electrical impulses for reproduction as printed messages, pictures, or other data. *1977*

communication satellites
Satellites designed to reflect or relay electromagnetic signals used for communication. *SP-7 1968*

commutation
Sequential sampling, on a repetitive timesharing basis, of multiple data sources for transmitting or recording, or both, on a single channel. *SP-7 1968*

commutators
Devices used to accomplish time division multiplexing by repetitive sequential switching. *SP-7 1968*

companding
A process in which compression is followed by expansion, as in noise reduction systems. *1981*

comparators
In computer operations, devices or circuits for comparing information from two sources. *SP-7 1968*

compasses
Instruments for indicating a horizontal reference direction, specifically a magnetic compases. *SP-7 1968*

compatibility
A characteristic ascribed to a major subsystem that indicates it functions well in the overall system. Also applied to the overall system with reference to how well its various subsystems work together, as in 'the vehicle has good compatibility'. Also applied to materials which can be used in conjunction with other materials and not react with each other under normal operating conditions. *SP-7 1968*

complement
An angle equal to 90 deg. minus a given angle. The true complement of any quantity in positional notation, i.e. the quantity which, when added to the first quantity, gives the least quantity containing one more place. The base-minus-one complement of any quantity in positional notation; i.e., the quantity which when added to the first quantity containing the same number of places. *SP-7 1976*

complementary metal oxide semiconductors
Use CMOS

complex compounds
Chemical compounds in which part of the molecular bonding is of the coordinate type. *1980*

compliance (elasticity)
Use modulus of elasticity

components
An article which is a self-contained element of a complete operating unit and performs a function necessary to the operation of that unit. Used for parts. *SP-7 1968*

composite materials
Structural materials of metals, ceramics, or plastics with built-in strengthening agents which may be in the form of filiments, foils, powders, or flakes of a different compatible material. Used for composites and pyrographalloy. *SP-7 1968*

composite propellants
Solid rocket propellants consisting of a fuel and an oxidizer neither oh which would burn without the presence of the other.*SP-7 1968*

composites
Use composite materials

compressibility
The property of a substance, as air, by virtue of which its density increases with increase in pressure. *SP-7 1968*

compressible flow
In aerodynamics, flow at speeds sufficiently high that density changes in the fluid cannot be neglected. *SP-7 1968*

compression ratio
In internal combustion engines, the ratio between the volume displaced by the piston plus the clearance space, to the volume of the clearance space. *1980*

compression waves
In acoustics, waves in an elastic medium which cause an element of the medium to change its volume without undergoing rotation. Mathematically, a compression wave is one whose velocity wave has zero curl. *SP-7 1968*

compressive strength
The maximum load sustained by a standard specimen of a material when subjected to a crushing force. *ASTM (C 11, C-11) 1968*

compressor blades
Blades which are either rotor blades or stator blades in axial-flow compressors; sometimes used restrictively (and ambiguously for compressor rotor blades. *SP-7 1968*

compressors
Machines for compressing air or other fluids. *SP-7 1968*

Compton effect
The decrease in frequency and increase in wavelength of x rays or gamma rays when scattered by free electrons. *SP-7 1968*

compulsators
Compensated pulsed alternators i.e., single phased alternators designed for pulsed power duty with air gap armature windings and air gap compensating windings. *1983*

computational chemistry
A complementary method for determining properties of gases, solids, and their interactions from first principle calculations. It extends testing capabilities to realms that are too dangerous or too costly to obtain experimentally. *1983*

computational fluid dynamics
The application of large computer systems for the numerical solutions of complex fluid dynamics equations. *1979*

computer aided design
The use of the computer in design work. Used for CAD (design), computer aided engineering, and computerized design. *SP-7 1968*

computer aided engineering
Use computer aided design

computer aided manufacturing
Interactive computing in support of manufacturing. Used for CAM (manufacturing). *1982*

computer aided mapping
Creating data bases of topographic and man-made features for the production of traditional maps and digital maps. Resultant digital maps have great flexibility and can be easily updated. The user can select the appropriate scale, view selected features, and view any desired area. *1983*

computer compatible tapes
Machine readable tapes. *1980*

computer graphics
The technique of combining computer calculations with various display devices, printers, plotters, etc. to render information in graphical or pictorial format. Used for interactive graphics. *DOE 1969*

computer information security
Protective measures to prevent destruction, larceny, and/or unauthorized use of information in computerized files. Used for computer security. *1976*

computer networks
The interconnection of two or more computers for the mutual or individual processing of data to and from a mulitiude of terminals or stations by utilizing appropriate switching techniques, transmission systems, or miniprocessors. *1976*

computer program integrity
The completeness of a program to execute its intended function. *1980*

computer security
Use computer information security

computer simulation
Use computerized simulation

computer systems performance
The efficiency and reliability that characterize the real operation of the system. *1980*

computer systems simulation
Forecasting of computer requirements by the use of predictive modeling and estimating computer workloads. *1980*

computer vision
Capability of computers to analyze and act on visual input. *1981*

computerized design
Use computer aided design

computerized simulation
Computer-calculated representation of a process, device, or concept in mathematical form. Used for ARIP (impact prediction), automatic rocket impact predictors, computer simulation, and IP (impact prediction). *DOE 1968*

ComStar C
The third in a series of Comsat domestic communications satellites launched in a transfer orbit by NASA for COMSAT. *1985*

ComStar satellites
Series of domestic Comsat communication satellites. *1985*

concatenated codes
Two or more codes which are encoded and decoded in series. *1982*

concentration
The quantity of a substance contained in a unit quantity of sample. *ASTM (E 135, E-2) 1968*

concentric spheres
Structures in which the space between the spheres is utilized for experiments involving fluid flow, etc. *1980*

concrete structures
Buildings, dams, stadiums, etc. constructed entirely of a mixture of aggregates, water, and portland cement. *1980*

concretes
Homogeneous mixtures of portland cement, aggregates, and water and which may contain admixtures. *ASTM (C 822, C-13) 1968*

condensation
The physical process by which a vapor becomes a liquid or solid; the opposite of evaporation. Specifically, in meteorology, the the transformation from vapor to liquid. *SP-7 1968*

condensation nuclei
Liquid or solid particles upon which condensation of water begins in the atmosphere. *1983*

conductance
Use resistance

conducting
Use conduction

conducting media
Use conductors

conduction
The transfer of energy within and through a conductor by means of internal particle of molecular activity and without any net external motion. Used for conducting. *SP-7 1968*

conduction bands
A range of states in the energy spectrum of a solid in which electrons can move freely. *SP-7 1968*

conductivity
The ability to transmit, as electricity, heat, sound, etc. A unit measure of electrical conduction; the facility with which a substance conducts electricity, as represnted by the current density per unit electrical-potential gradient in the direction of flow. *SP-7 1968*

conductors
Substances or entities which transmit electricity, heat, or sound. Used for conducting media. *SP-7 1968*

cones
Geometric configurations having a cicular bottom and sides tapering off to an apex (as in nose cone). Used for conical flare and fusiform shapes. *SP-7 1968*

confidence limits
In statistics, the upper and lower extremes of the confidence interval. *SP-7 1968*

configuration interaction
In physical chemistry, the interaction between two different possible arrangements of the electrons in an atom or molecule. *1979*

confluence
Use convergence

conical flare
Use cones

conical scanning
Scanning in which the direction of maximum radiation generates a cone whose vertex angle is of the order of the beam width. Such scanning may be either rotating of nutating, according as the direction of polarization rotates or remains unchanged. *SP-7 1968*

conjugate gradient method
An interactive method for solving a system of linear equations of dimension N which terminates in at most N steps if no rounding errors are encountered. Each iterate will bring one closer to the solution. *1983*

conjugated circuits
Branches of an electrical network configured so that a change in the electromotive force in either branch does not result in a current change in the other. *1981*

consistency
A property of a material determined by the complete flow force relation. *ASTM (C 11, C-11) 1968*

consoles
Arrays of controls and indicators for the monitoring and control of a particular sequence of actions, as in the checkout of a rocket, a countdown action, or a launch procedure. *SP-7 1968*

constant volume balloons
Use superpressure balloons

constellations
Originally conspicuous configurations of stars; now regions of the celestial sphere marked by arbitrary boundary lines. *SP-7 1968*

consumables (spacecraft)
All supplies for spacecraft and spacecrews that will be consumed during a mission. *1979*

contact loads
Dynamic loading by contact between two bodies. *1987*

contact potentials
The potential differences at the junctions of two dissimilar substances. *ASTM (B 374, B-8) 1968*

contact resistance
The resistance to current flow between two touching bodies, consisting of constriction resistance and film resistance. *ASTM (B 667, B-4) 1968*

containers
A non specific term for recepticles capable of closure. Used for receptacles (containers). *ASTM (D 996, D-10) 1968*

context
The composition, structure, or manner in which something is put together. Also refers to the situation or environment of an event. *1980*

continental margins
Use continental shelves

continental shelves
The ocean floor that is between the shoreline and the abyssal ocean floor, including various provinces; the continental shelf; continental borderland; continental slope; and the contiental rise. Used for continental margins. *DOE 1969*

continuous flow electrophoresis
Use electrophoresis

continuous spectra
Spectra in which wavelengths, wave numbers, and frequencies are represented by the continum of real numbers or a portion thereof, rather than by a discrete sequence of numbers. For electromagnetic radiation, spectra that exhibit no detailed structure and represent a gradual variation of intensity with wavelength from one end to the other, as the spectra of incandescent solids. For particles, spectra that exhibit a continuous variation of the momentum or energy. *SP-7 1968*

continuums
Things that are continuous, which have no discrete parts as the continuum of real numbers as opposed to the sequence of discrete integers, as the background continuum of a spectrogram due to thermal radiation. *SP-7 1968*

contour sensors
The sensing of image coincidences by means of optical processing techniques. *1980*

contrarotating propellers
Two propellers mounted on concentric shafts having a common drive and rotating in opposite directions. *1982*

contrast
In general, the degree of differentiation between different tones in an image. *SP-7 1968*

control rockets
Vernier engines, retrorockets, or other such rockets, used to change the attitude of, guide, or make small changes in the speed of a rocket, spacecraft, or the like. Used for steering rockets. *SP-7 1968*

control units (computers)
Those parts of computers that cause the arithmetic unit, storage, and transfer of a computer to operate in proper sequence. *SP-7 1969*

controllability
The capability of an aircraft, rocket, or other vehicle to respond to control, especially in direction or attitude. Used for handling qualities. *SP-7 1968*

controlled avalanche transit time devices
Use CATT devices

convection
In general, mass motion within a fluid resulting in transport and mixing of the properties of that fluid. Specifically, in meteorology, atmospheric motions that are predominately vertical. *SP-7 1968*

convergence
Approach to a limit, e.g. by an infinite sequence. Used for confluence. *DOE 1968*

convertaplanes
Use V/STOL aircraft

converters
Rotary devices for changing alternating current to direct current. Transducers whose output is a different frequency from its input. *SP-7 1968*

coolants
Liquids of gases used to cool something, as a rocket combustion chamber. *SP-7 1968*

coordinate systems
Use coordinates

coordinates
Sets of measures defining points in space. Used for axes (coordinates) and coordinate systems. *SP-7 1968*

copolymers
Polymers formed from two or more types of monomers. *ASTM (D 1566, D-11) 1968*

cordite
Use double base propellants

coriolis effect
The physiological effect felt by a person moving radially in a rotating system, as a rotating space station resulting in nausea vertigo, dizziness, etc. *SP-7 1968*

corona discharges
Use electric corona

coronal holes
Solar areas where exteme UV and x ray coronal emission is abnormally low or absent. These are coronal regions apparently associated with diverging magnetic fields. *1978*

coronal loops
Loop like structures revealed in soft x ray images of the solar limb and believed to evolve from the introduction of energy and density perturbations at the top of an arched, cylindrical magnetic flux tube initially in equilibrium in the coronal plasma. *1980*

corpuscular radiation
Nonelectromagnetic radiation consisting of energetic charged or neutral particles. Used for penetrating particles. *1968*

correction
A quantity, equal in absolute magnitude to the error, added to a calculated or observed value to obtain a true value. *SP-7 1968*

correlation
In statistics, a relationship between two occurences which is expressed as a number between minus one (-1) and plus one (+1). Used for correlation functions. *SP-7 1968*

correlation detection
A method of detection in which a signal is compared, point-to-point, with an internally generated reference. *SP-7 1968*

correlation functions
Use correlation

correlators
Devices that detect weak signals in noise by performing an electronic operation. Used for synchronous detectors. *1968*

corrosion
The deterioration of a metal by chemical of electrochemical reaction with its environment. Used for metal corrosion. *SP-7 1968*

Cosmic Background Explorer satellite
A NASA satellite planned for launch in 1989 on a Delta I expendable launch vehicle. It is designed to measure backgound radiation in order to confirm or deny the big bang theory. Used for COBE. *1979*

cosmic dust
Finely divided solid matter with particle sizes smaller than a micrometeorite, thus with diameters much smaller than a millimeter, moving in interplanetary space. *SP-7 1968*

cosmic gamma ray bursts
Use gamma ray bursts

cosmic noise
Interference caused by cosmic radio waves. *SP-7 1968*

cosmic radiation
Use cosmic rays

cosmic rays
The aggregate of extremely high energy subatomic particles which travel the solar system and bombard the earth from all directions. Cosmic ray primaries seem to be mostly protons, hydrogen nuclei, but also contain heavier nuclei. On colliding with atmospheric particles thay produce many different kinds of lower energy secondary cosmic radiation. Used for cosmic radiation. *SP-7 1968*

cosmochemistry
The branch of chemistry that deals with the chemical composition and changes in the universe. *1981*

Cosmos 782 satellite
One in a series of satellites launched by the USSR reportedly for geophysical observations. *1977*

Cosmos 936 satellite
One in a series of satellites launched by the USSR reportedly for geophysical observations. *1977*

Cosmos 954 satellite
A Russian ocean surveillance satellite which reentered over Canada spreading radioactive debris. *1982*

Cosmos 1129 satellite
Soviet VOSTOK biological spacecraft launched on September 25, 1979 carrying experiments from several nations. NASA contributed 13 experiments. *1979*

COSPAS
The USSR satellite of the COSPAS-SarSat project which is a satellite-aided project for the search and rescue of distressed vehicles, administered by USSR, US, French, and Canadian agencies. *1983*

Coulomb collisions
The collisions of sets of two particles both of which are charged. *SP-7 1968*

coulometers
Electrolytic cells or electronic devices arranged to measure the quantity of electricity by the chemical action produced in accordance with Faraday's law. *ASTM (C 859, C-26) 1968*

countdown
A step-by-step process that culminates in a climatic event, each step being performed in accordance with a shedule marked by a count in inverse numerical order; specifically, this process is used in leading up to the launch of a large of complicated rocket vehicle, or in leading up to a captive test, a readiness firing, a mock firing or other firing test. *SP-7 1968*

counter rotation
Movement of sets of bodies or fluids around a common axis where movement in own rotational direction is opposed by movement in the opposite direction. *1981*

coupled modes
Modes of vibration that are not independent but which influence one mode to the other. Used for mode coupling. *SP-7 1968*

couplings
Devices or contrivances for joining adjacent ends or parts of anything. Devices permitting transfer of energy from one electrical circuit to another, or from one mechanical device to another. *SP-7 1968*

crack closure
Phenomenon which occurs when the cyclic plasticity of a material gives rise to the development of residual plastic deformations in the vicinity of a crack tip, causing the fatigue crack to close at positive load. *1980*

crack geometry
The shape and size of partial fractures or flaws in materials. *1980*

crack tips
The boundaries between cracked and uncracked material. *1983*

cracking (chemical engineering)
A process used to reduce the molecular weight of hydrocarbons by breaking molecular bonds by thermal, catalytic, or hydrocracking methods. *1979*

Crank-Nicholson method
A method for solving parabolic partial differential equations, whose main feature is an implicit method which avoids the need for using very small time steps. *1982*

crashworthiness
The ability of a vehicle to withstand a crash. *1982*

Cray computers
Supercomputers built by Cray Research Inc. that require the supporting services of another front end general purpose computer for operation. They incorporate very fast scalar and vector hardware, are used primarily for the simulation of physical phenomena, and are programmed in FORTRAN. *1983*

creep resistance
Use creep strength

creep strength
The constant nominal stress that will cause a specified quantity of creep in a given time at constant temperature. Used for creep resistance. *SP-7 1968*

crestatrons
Use traveling wave tubes

crew procedures (inflight)
Operations performed by crews aboard aircraft or spacecraft during flight. Includes flight operations as well as spaceborne experiment prcedures. *1979*

crew procedures (preflight)
Operations performed by crews aboard aircraft or spacecraft and by ground support crews before flight or launching. *1979*

crew size
The number of people in a crew. *1981*

criteria
The minumum standards or limits on which judgements may be based. *ASTM (E 541, E-6) 1968*

critical frequencies
The limiting frequencies below which magnetoionic wave components are reflected and above which they penetrate through, an ionized medium (plasma) at vertical incidence. *SP-7 1968*

critical Mach number
Use critical velocity

critical mach number
Use Mach number

critical mass
The amount of concentrated fissionable material that can just support a self-sustaining fission reaction. *SP-7 1968*

critical point
The thermodynamic state in which liquid and gas phases of a substance coexist in equilibrium at the highest possible temperature. At higher temperature than the critical no liquid phase can exist. *SP-7 1968*

critical pressure
In rocketry, the pressure in the nozzle throat for which the isentropic weight flow rate is maximum. The presure of a gas at the critical point, which is the highest pressure under which a liquid can exist in equilibrium with its vapor. *SP-7 1968*

critical Reynolds number
Use critical velocity
Reynolds number

critical speed
Use critical velocity

critical temperature
The temperature above which a substance cannot exist in the liquid state regardless of the pressure. As applied to reactor overheat or afterheat, the temperature at which the least resistant component of the reactor core begins to melt down. As applied to materials, the temperature at which a change in phase takes place causing an appreciable change in the properties of the material. *SP-7 1968*

critical velocity
In rocketry, the speed of sound at the conditions prevailing at the nozzle throat. Used for critical Mach number, critical Reynolds number, and critical speed. *SP-7 1968*

crop calendars
Schedules for the maturation and harvesting of seasonal crops. *1980*

crop dusting
The application of fungicides or insecticides in powder form to a crop, usually from a low flying aircraft. *1979*

crop inventories
Numerical estimates of vegetable, fruit, and other commercial farm products based on the analysis of photography or imagery from aircraft or satellites made during periodic passes during the growth cycle. *1977*

Crop Inventories by Remote Sensing
Use AgRISTARS project

cross faults
Use geological faults

cross flow
A flow going across another flow, as a spanwise flow over a wing. *SP-7 1970*

cross polarization
The component of the electric field vector normal to the desired polarization component. *1977*

cross sections
Measures of the effectiveness of particular processes expressed either as areas (geometric cross sections) which would produce the observed results, or as ratios. *SP-7 1968*

crosstalk
Electrical disturbances in a communication channel as a result of coupling with other communication channels. *SP-7 1968*

crustal dynamics
Use geodynamics

cryochemistry
The study of chemical phenomena in very low temperature environment. *1978*

cryogenic cooling
Use of cryogenic fluids to reach temperatures near absolute zero. *1980*

cryogenic rocket propellants
Rocket fuels, oxidizers, or propulsion fluids which are liquid only at very low temperatures. *SP-7 1968*

cryogenic wind tunnels
Wind tunnels employing a cryogenic environment and utilizing independent control over Mach number, Reynolds number, aeroelastic effects, and model-tunnel interactions. *1976*

cryogenics
The study of the methods of producing very low temperatures. The study of the behavior of materials and processes at cryogenic temperatures. *SP-7 1968*

cryopumping
The process of removing gas from a system by condensing it on a surface maintained at very low temperatures. *SP-7 1968*

cryosorption
Use sorption

cryotrons
Devices based upon the principle that superconductivity established at temperatures near absolute zero is destroyed by the application of a magnetic field. *SP-7 1968*

cryptography
The science of preparing messages in a form which cannot be read by those not privy to the secrets of the form. *1981*

crystal dislocations
Types of lattice imperfections whose existence in metals is postulated in order to account for the phenomenon of crystal growth and of slip, particularly for the low value of shear stress required to initiate slip. *SP-7 1968*

crystal lattices
Three-dimensional, recurring patterns in which the atoms of crystals are arranged. *SP-7 1968*

cultural resources
Archaeological and historical sites. *DOE 1972*

Curie temperature
The temperature in a ferromagnetic material above which the material becomes substantially nonmagnetic. *SP-7 1968*

curl (vectors)
A vector operation upon a vector field which represents the rotation of the field, related to the circulation of the field at each point. *SP-7 1968*

currents (oceanography)
Use water currents

curvilinear coordinates
Use spherical coordinates

cut-off
An act or instance of shutting something off; specifically, in rocketry, an act or instance of shutting off the propellant flow in a rocket, or stopping the combustion of the propellant. *SP-7 1968*

cyanide emission
Use CN emission

cybernetics
The study of methods of control and communication which are common to living organisms and machines. *SP-7 1968*

cycles
The complete sequences of values of a periodic quantity that occur during a period. Used for cycling and periodic processes. *SP-7 1968*

cyclic adenosine monophosphate
Use cyclic AMP

***cyclic* AMP**
A nucleotide which is implicated as an intracellular messenger in a wide variety of cellular processes. Prototypically it acts as as a molecular transducer of nonsteroid signals from outside the the cell to relevant cellular enzymes by a series of reactions. Used for cyclic adenosine monophosphate. *1983*

cyclic compounds
In organic chemistry, compounds containing a ring of atoms. *1977*

cycling
Use cycles

cyclones (equipment)
Use centrifuges

cyclotron frequency
Frequency at which a charged particle orbits in a uniform magnetic field. It depends on the charge to mass ratio of the particle times the magnetic field. While the frequency is independent of the particle energy, Lamor orbit increases with energy. *SP-7 1968*

cyclotron radiation
The electromagnetic radiation emitted by charged particles as they orbit in a magnetic field. The radiation arises from the centripetal acceleration of the particle as it moves in a circular orbit. *SP-7 1968*

cyclotron resonance
Energy transfer to charged particles in a magnetic field from an alternating-current electric field whose frequency is equal to the cyclotron frequency. *SP-7 1968*

cyclotron resonance devices
Microwave amplifiers based on the interaction between electromagnetic waves and transverse electron streams moving along helical trajectories. Used for gyrotrons. *1978*

cylindrical afterbodies
Use afterbodies

cylindrical plasmas
Magnetic self-attraction of parallel electric currents causing constriction of a conducting plasma through which a large current is flowing. *1980*

cylindrical waves
Waves in which the wave fronts are coaxial cylinders. *SP-7 1968*

Czechoslovakian spacecraft
Spacecraft of Czechosolovakia. *1980*

D

DAEMO (data analysis)
Use data processing
data reduction

Dalton law
The empirical generalization that for many so called perfect gases, a mixture of these gases will have a pressure equal to the sum of the partial pressures that each of the gases would have as a sole component with the same volume and temperature, provided there is no chemical interaction. *SP-7 1968*

DAMA
Use demand assignment multiple access

damage assessment
Estimate of injury or loss to components, subsystems, or entire systems, as well as the cost of repairs or replacement to restore serviceability. *1980*

damping
The suppression of oscillations or disturbances; the dissipation of energy with time. Used for damping factor, damping in pitch, damping in roll, damping in yaw, elastic stability, and jet damping. *SP-7 1968*

damping factor
Use damping

damping in pitch
Use damping
pitch (inclination)

damping in roll
Use damping
roll

damping in yaw
Use damping

dark adaptation
The process by which the iris and retina of the eye adjust to allow maximum vision in dim illumination, following exposure of the eye to a relatively brighter illumination. *SP-7 1968*

Dassault Mystere 50 aircraft
Use Mystere 50 aircraft

DAST program
A NASA program which uses the Firebee 2 target drone aircraft as a test bed for getting flight data on research wings. The drone is launched from the wing of a B52 and recovered by parachute. The program's purpose is the study of flight loads and load control. Used for drones for aerodynamic and struct test. *1983*

data adaptive evaluator/monitor
Use data processing
data reduction

data analysis
Use data processing
data reduction

data base management systems
Software products that control data structures containing interrelated data stored so as to optimize accessibility and and control, minimize redundancy, and offer multiple views of the data to various applications programs. *1981*

data integration
Taking data from multiple sources and merging the data into a single data file. *1982*

data links
Communications channels or circuits used to transmit data from a sensor to a computer, a readout device or a storage device. *SP-7 1968*

data processing
Application of procedures, mechanical, electrical, computational, or other whereby data are changed from one form to another. Used for automatic data processing, DAEMO (data analysis), data adaptive evaluator/monitor, and data analysis. *SP-7 1968*

data processing equipment
Machines for handling information in a sequence of reasonable operations. Used for data processors. *SP-7 1968*

data processors
Use data processing equipment

data reduction
Transformation of observed values into useful, ordered, or simplified information. Used for DAEMO (data analysis), data adaptive evaluator/monitor, data analysis, and TARE (data reduction). *SP-7 1968*

data simulation
The use of statistical or physical models to produce synthetic data for testing purposes. *1982*

data smoothing
The mathematical process of fitting a smooth curve to dispersed data points. *SP-7 1968*

data structures
The organization of computer memory used to represent information in a computer program or data base. *1982*

data transfer (computers)
The technique used by the hardware manufacturer to transmit data from computer to storage device or from storage device to computer, usually under specialized program control. *1986*

dawsonite
A mineral consisting of aluminum sodium carbonate. *1980*

DBS (satellites)
Use direct broadcast satellites

deacclimatization
Use acclimatization

dead reckoning
In navigation, determination of position by advancing a previous known position for courses and distances. *SP-7 1968*

debugging
Use checkout

Debye length
A theoretical length which describes the maximum separation at which a given electron will be influenced by the electric field of a given positive ion. *SP-7 1968*

Debye temperature
Use specific heat

decay
Decrease of a radioactive substance because of nuclear emission of alpha or beta particles, positrons, or gamma rays. *SP-7 1968*

Decca navigation
A long range, ambiguous, two dimensional navigation system using continuous wave transmission to provide hyperbolic lines of position through the radio frequency phase comparison techniques from four transmitters. *SP-7 1968*

deceleration
The act or process of moving, or of causing to move, with decreasing speed. Used for impact deceleration. *SP-7 1968*

decision elements
Use logical elements

declination
Angular distance north or south of the celestial equator; the arc of an hour circle between the celestial equator and a point on the celestial sphere, measured northward or southward from the celestial equator through 90 degrees, and labeled N or S to indicate the direction of measurement. *SP-7 1968*

decoders
Devices for translating electrical signals into predetermined functions. In computer operations, networks or devices in which one of two or more possible outputs results from a prescribed combination of inputs. *SP-7 1968*

decommissioning
Disposal or deactivation of equipment or sites whose usefulness has diminished to a point where it is no longer required for its original purpose. *1981*

decommutators
Equipment for separation, demodulation, or demultiplexing commutated signals. *SP-7 1968*

decompression sickness
A disorder experienced by deep sea divers and aviators caused by reduced atmospheric pressure and evolved gas bubbles in the body, marked by pain in the extremities, pain in the chest (chokes), occasionally leading to severe central nervous symptoms and neurocirculatory collapse. Used for bends (physiology). *SP-7 1968*

deep well injection (wastes)
Storage of liquid wastes, particularly chlorohydrocarbons, by injection into subsurface geologic strata for long term isolation from the environment. *1977*

Defense Meteorological Satellite Program
Use DMSP satellites

deflagration
A sudden or rapid burning, as opposed to a detonation or explosion. *SP-7 1968*

deflectors
Plates, baffles, or the like that divert something in its movement or flow. *SP-7 1968*

deformation
A change in the shape or size of a solid body. *ASTM (D 653, D-18) 1968*

degassing
The deliberate removal of gas from a material, usually by application of heat under high vacuum. Used for bakeout. *SP-7 1968*

degenerate matter
A state of matter found in white dwarf stars and other ultrahigh-density objects in which the electrons follow Fermi-Dirac statistics, i.e. the matter reaches a density high enough so that the pressure increases more and more rapidly to the point where it becomes independent of the temperature and is a function of the density only, thereby departing from the classical laws of physics. *1987*

degenerative feedback
Use negative feedback

degradation
Gradual deterioration in performance. *SP-7 1968*

degrees of freedom
A mode of motion, either angular or linear, with respect to a coordinate system, independent of any other mode. A body in motion has six possible degrees of freedom, three linear and three angular. *SP-7 1968*

dehumidification
The reduction, by any process, of the quantity of water vapor within a given space. *ASTM (E 41, G-3) 1968*

Deimos
A satellite of Mars orbiting at a mean distance of 23,500 kilometers. *SP-7 1968*

deionization
The removal of ions from a solution by ion exchange. *ASTM (B 374, B-8) 1968*

delay lines (computer storage)
In electronic computers, devices for producing a time delay of a signal. *SP-7 1968*

delta wings
Triangularly shaped wings of aircraft. Used for triangular wings. *SP-7 1968*

demagnetization
The reduction of residual magnetism to an acceptable level. *ASTM (E 269, E-7) 1968*

demand assignment multiple access
A technique of assigning communication resources on an 'as needed basis' such as in satellite communications. Used for DAMA. *1982*

demodulators
Electronic devices which operate on an input of a modulated carrier to recover the modulating wave as an output. *SP-7 1968*

demography
Statistical study of human populations especially with reference to size, density, distribution, and vital data. *1979*

demultiplexing
Separation of two or more signals that were previously combined by a compatible multiplexer and transmitted over a single channel. *1982*

dendrochronology
The use of annual growth rings in plant tissue to determine the age of the plant or tree. Used for tree ring dating. *1980*

densimeters
Instruments for measuring the density or specific gravity of liquids, gases, or solids. *1979*

densitometers
Instruments for the measurement of optical density (photographic transmission, photographic reflection, visual transmission, etc.) of a material, generally of a photographic image. *SP-7 1968*

density (rate/area)
Use flux density

dependent variables
Variables considered as a function of other variables, the latter being called independent. *SP-7 1968*

depolarization
A decrease in the polarization of an electrode at a specified current density. Used for depolarizers. *ASTM (B 374, B-8) 1968*

depolarizers
Use depolarization

depth perception
Use space perception

desertification
The formation of a desert or the gradual expansion of a desertline into previously usable land, due to man-made or natural causes. *1984*

desiccants
Chemicals used to absorb moisture. *ASTM (A 700, A-1) 1968*

design to cost
A process whereby cost factors are determined and calculated for the life cycle of a product as an integral part of its design. *1981*

desorption
The process of removing sorbed gas. *SP-7 1968*

desynchronization (biology)
The loss of synchronization between two or more rhythms so that they show independent periods. *1982*

detachment
A particular state of isolation in which man is separated or detached from his accustomed behavioral environment by inordinate physical and psychological distances. This condition may compromise his performance. *SP-7 1968*

detectors
Sensors or instruments employing a sensor. *SP-7 1968*

determination
Use measurement

detonation
A rapid chemical reaction which propagates at a supersonic velocity. Used for Chapman-Jouget flame. *SP-7 1968*

detonation waves
Shock waves that accompany detonation and have a shock front followed by a region of decreasing pressure in which the reaction occurs. *DOE 1968*

deuterium
A heavy isotope of hydrogen having one proton and one neutron in the nucleus. Used for hydrogen 2. *SP-7 1968*

deuterium fluoride lasers
Use DF lasers

deuterium fluorides
Fluorides of deuterium, a heavy isotope of hydrogen. Used for DF. *1976*

deuterium oxides
Use heavy water

deuterons
The nuclei of deuterium atoms. *SP-7 1968*

deviation
The variation from a specified dimension or design requirement, usually defining upper and lower limits. *ASTM (E380, E-43) 1968*

dew point
Temperature at which water vapor begins to condense. *1981*

dewatering
Removal of water by draining, pumping, or other means. *1980*

DF
Use deuterium fluorides

DF lasers
Gas lasers in which the active material is deuterium fluoride. Used for deuterium fluoride lasers. *1976*

DHC Beaver aircraft
Use DHC 2 aircraft

DHC 2 aircraft
De Havilland Canada STOL utility aircraft. Used for DHC Beaver aircraft. *1978*

diameters
Lengths of the longest straight lines through the centers of the largest cross sections. *ASTM (F 547, F-16) 1968*

diaphragm (anatomy)
Musculomembranous partition separating the abdominal and thoracic cavities. *DOE 1968*

didymium
A mixture of rare earth elements that is freed from cerium. It was once regarded as an element but contains chiefly neodymium and praseodymium and is usually associated with lanthanum. It is used in coloring glass for optical filters. *1982*

dielectric materials
Use dielectrics

dielectrics
Substances that contain few or no free charges and which can support electrostatic stresses. Used for dielectric materials. *SP-7 1968*

dielectronic satellite lines
Use resonance lines

differential analyzers
Analog computers designed and used primarily for solving differential equations. *SP-7 1984*

differential pulse code modulation
An efficient signal encoding method of reducing the transmission rate of digital signals. The basic principle of DPCM is to quantize code and transmit the difference between the actual sample and prediction value. Used for DPCM (modulation). *1981*

differential thermal analysis
Use thermal analysis

differentiators
In computer operations, devices whose output is porportional to the derivative of an input signal. In electronics, a transducer whose output waveform is the time derivative of its input waveform. *SP-7 1968*

diffraction
The process by which the direction of radiation is changed so that it spreads into the geometric shadow region of an opaque or refractive object that lies in a radiation field. Used for interference monochromatization and Kirchhoff-Huygens principle. *SP-7 1968*

diffraction propagation
Wave propagation around objects, or over the horizon, by diffraction. *SP-7 1968*

diffraction radiation
Electromagnetic radiation excited by an electron flux passing near a diffractive, periodic structure, such as a wiggler magnet in a free electron laser. *1986*

diffuse radiation
Radiant energy propagating in many different directions through a given small volume of space; to be contrasted with parallel radiation. Used for lunar scattering. *SP-7 1968*

diffusers
Specially designed ducts, chambers, or sections, sometimes equipped with guide vanes, that decrease the velocity of a fluid, as air, and increases its pressure, as in jet engines, wind tunnels, etc. Used for shock diffusers. *SP-7 1968*

diffusion
In an atmosphere, or in any gaseous system, the exchange of fluid parcels between regions, in apparently random motions of a scale too small to be treated by the equations of motion. In materials, the movement of atoms of one material into the crystal lattice of an adjoining material, e.g., penetration of the atoms in a ceramic coating into the lattice of the protected metal. In ion engines, the migration of neutral atoms through a porous structure incident to ionization at the emitting surface. Used for diffusion effect and perfusion. *SP-7 1968*

diffusion coefficient
The absolute value of the ratio of the molecular flux per unit area to the concentration gradient of a gas diffusing through a gas or a porous medium where the molecular flux is evaluated across a surface perpendicular to the direction of the concentration gradient. *SP-7 1968*

diffusion effect
Use diffusion

diffusivity
A measure of the rate of diffusion of a substance, expressed as the diffusivity coefficient K. *SP-7 1968*

digital circuits
Use digital electronics

digital computers
Computers which operate with information, numerical or otherwise, represented in a digital form. *SP-7 1968*

digital electronics
The use of circuits in which there are usually only two states possible at any point. The two states can represent any of a variety of binary digits (bits) of information. Used for digital circuits. *1986*

digital filters
Computational means of attenuating undesired frequencies in sets of time-dependent data. *DOE 1969*

digital television
Television in which picture redundancy is reduced or eliminated by transmitting only the data needed to define motion in the picture, as represented by changes in the areas of continuous white or black. *1977*

digitizers
Use analog to digital converters

dihydroxyphenylalanine
Use dopa

dikes (geology)
Use rock intrusions

dilatometers
Use extensometers

Dione
One of the natural satellites of Saturn orbiting at a mean distance of 378,000 kilometers. *1980*

dipole antennas
A straight radiator, usually fed in the center, and producing a maximum of radiation in the plane normal to its axis. The length specified is the overall length. SN (single dipole antennas) *SP-7 1968*

dipoles
Systems composed of two, separated, equal electric or magnetic charges of opposite sign. *SP-7 1968*

direct broadcast satellites
Domestic satellites used for direct TV transmission to home receivers. Used for DBS (satellites). *1986*

direction finders (radio)
Use radio direction finders

direction finding
A procedure or process for locating or localizing the origin of radar, acoustical, or optical emissions. *1982*

directional antennas
Antennas that radiate or receiver radio signals more efficiently in some directions than in others. Used for tracking antennas. *SP-7 1968*

directional solidification (crystals)
Controlled solidification (crystal growth) of molten metal in a casting so as to provide feed metal to the solidifying front of the casting. *1977*

directional stability
The property of an aircraft, rocket, etc., enabling it to restore itself from a yawing or sideslipping condition. *SP-7 1968*

directivity
The ability of an antenna to radiate or receive more energy in some directions. *SP-7 1968*

directories
Alphabetical, geographical, or classified listings by field of persons, organizations, programs and/or objects such as instruments, devices, and products. Use of this term excludes directories in computers. *1983*

dirigibles
Use airships

disasters
Large-scale drought, glacier movement, floods, fires, storms, etc. *DOE 1968*

discontinuity
A break in sequence or continuity of anything. *SP-7 1968*

Discos (satellite attitude control)
A satellite orbit 'DIsturbance COmpensation System' designed to maintain an object (proof object) in correct orbit by detecting forces and compensating for them by using thrusters. *1981*

discrete address beacon system
Radar beacon system with discretely addressable transponders and a ground-air-ground data link for automated air traffic control (FAA). *1977*

discriminant analysis (statistics)
A linear combination of a set of N variables that will classify (into two different classes) the events or items for which the measurements of the N variables are available, with the smallest proportion of misclassifications. Used for discriminant functions. *1981*

discriminant functions
Use discriminant analysis (statistics)

discriminators
In general, a circuit in which output depends upon the difference between an input signal and a reference signal. *SP-7 1968*

dishes
Use parabolic reflectors

disk galaxies
Galaxies consisting of a central bulge of a spheroidal aggregation of stars and a surrounding disk of stars fanning outward in a thin layer. *1979*

displacement
A vector quantity that specifies the change of position of a body the change of position of a body or particle usually measured from the mean position or position of rest. *SP-7 1968*

dissociation
The separation of a complex molecule into constituents by collision with a second body, or by absoption of a photon. The product of dissociation of a molecule is two ions, one positively charged and one negatively charged. Used for molecular dissociation. *SP-7 1968*

dissolved gases
Gases in solution. *1980*

distance measuring equipment
A radio aid to navigation which provides distance information by by measuring total round trip time of transmission from an integrator to a transponder and return. *SP-7 1968*

distance perception
Use space perception

distortion
An undesired change in waveform. In a system used for transmission or reproduction of sound, a failure by the system to transmit or reproduce a received waveform with exactness. An undesired change in the dimensions or shape of a structure as, distortion of a fuel tank due to abnormal stresses or extreme temperature gradients. *SP-7 1968*

distributed feedback lasers
Lasers containing a periodic medium which provides the necessary feedback for laser action. *1985*

distributed processing
Processing with multiple small computers that are capable of operating independently but can communicate over a network with each other and/or a central computer. *1982*

distribution functions
The density functions or number of particles per unit volume of phase space. The distribution functions are a function of the three space coordinates and the three velocity coordinates. *SP-7 1968*

diurnal rhythms
Use circadian rhythms

divergence
The expansion or spreading out of a vector field; also a precise measure thereof. A static instability of a lifting surface or of a body on a vehicle wherein the aerodynamic loads tending to deform surface or body are greater than the elastic restoring forces. *SP-7 1968*

DMSP satellites
Satellites of the defense meteorological satellite program, a program sponsored by the United States Air Force System Command's Space Division which provides timely global imagery and specialized meteorological data for supporting a variety of Department of Defense operations. Used for Defense Meteorological Satellite Program. *1983*

docking
Use spacecraft docking

documentation
The assembling, coding, and disseminating of recorded knowledge. *DOE 1968*

doghouses (electronics)
Small enclosures placed at the base of transmitting antenna towers to house antenna tuning equipment. *1976*

dolomite (mineral)
A common rock-forming rhombohedral material consisting of calcium, magnesium, and carbonates. It is used for refractory products. *DOE 1968*

dopa
An intermediate organic compound produced by oxidation of tyrosine by tyramine; also, an intermediate product in the synthesis of both epinephrine and melanin. Used for dihydroxyphenylalanine. *1980*

doping (additives)
Use additives

Doppler effect
The change in frequency with which energy reaches a receiver when the receiver and the energy source are in motion relative to each other. Used for DOVAP and stellar Doppler shift. *SP-7 1968*

Doppler navigation
Dead reckoning performed automatically by a device which gives a continuous indication of position by integrating the speed derived from measurement of the Doppler effect of echoes from directed beams of radiant energy transmitted from the craft. *SP-7 1968*

Doppler radar
Radar which detects and interprets the Doppler effect in terms of the radial velocity of a target. *SP-7 1968*

Doppler-Fizeau effect
The Doppler effect applied to a source of light. When the distance between the observer and the source of light is diminishing, the lines of the spectrum are displaced towards the violet, and, when the distance is increasing, they are displaced toward the red, the displacement being proportional to the relative velocity of approach or recession. *SP-7 1968*

dosimeters
Instruments for measuring the ultraviolet in solar and sky radiation. Devices worn by persons working around radioactive material, which indicate the dose of radiation to which thay have been exposed. Used for dosimetry. *SP-7 1968*

dosimetry
Use dosimeters

double base propellants
Solid rocket propellants using two unstable compounds, such as nitrocellulose and nitroglycerin. The unstable compounds used in a double based propellant do not require a separate oxidizer. Used for cordite. *SP-7 1968*

double stars
Stars which appear as single points of light to the eye but which can be resolved into two points by a telescope. A double star is not necessarily a binary, a two star system revolving about a common center, but may be an optical double, two unconnected stars in the same line of sight. *SP-7 1985*

doughnut shape wheels
Use toroidal wheels

DOVAP
Use Doppler effect

downlinking
The transmission of signals (data, information, etc.) from satellites to ground terminals. *1980*

downrange
The airspace extending downstream on a given rocket test range. *SP-7 1968*

downtime
A period during which eqipment is not operating correctly because of machine failure. *SP-7 1968*

DPCM (modulation)
Use differential pulse code modulation

drag
A retarding force acting upon the direction of motion of the body. it is a component of the total fluid forces acting on the body. Used for drag effect. *SP-7 1968*

drag balance
Use lift drag ratio

drag coefficients
The ratios of drag to the products of dynamic pressures and reference areas. *1982*

drag effect
Use drag

drag force anemometers
Instruments for measuring both the static and dynamic velocity head and flow in high frequency, unsteady flow. *1980*

dredged materials
Sand, mud, silt, gravel, etc. recovered from the bottoms of harbors, canals, etc. during dredging operations. *1977*

dredging
Mechanical or hydraulic excavation of underwater material. Used in maintaining and building of channels and ports as well as underwater mining of sand, gravel, and minerals. *1982*

drift rate
The amount of drift,in any of its several senses, per unit time. Drift rate has many specific meanings in different fields. The type of drift rate should always be specified. *SP-7 1968*

drone aircraft
Remotely controlled aircraft. Used for drone helicopters. *SP-7 1968*

drone helicopters
Use drone aircraft

drones for aerodynamic and struct test
Use DAST program

drooped airfoils
A baseline airfoil with an abrupt change in cross-section at about midspan from the fuselage. The outboard portion of the wing has a cross-section with a nearly flat bottom and a drooped (downward) leading edge in relation to the inboard baseline wing. *1979*

drop size
The diameter of a drop if it is approximately spherical; otherwise, the approximate shape and appropriate dimensions must be described. *ASTM (G 40, G-2) 1968*

drop towers
Large devices for low gravity processing of molten material which consist of either a capsule which is dropped, or a drop tube where containerless low gravity studies are conducted or both. Used for drop tubes. *1982*

drop tubes
Use drop towers

dropouts
Discrete variations in signal levels during the reproduction of recorded data which result in data reduction errors. *SP-7 1968*

drops (liquids)
Small bodies of liquid held together primarily by surface tension. Used for liquid drops. *ASTM (G 40, G-2) 1968*

dropsondes
Radiosondes equipped with a parachute, dropped from an aircraft to transmit measurements of atmospheric conditions as it descends. *SP-7 1968*

DTA (analysis)
Use thermal analysis

dual wing configurations
A configuration of two wings of nearly the same planform and area, one behind the other. *1981*

duality principle
Principle that for any theorem in electric circuit analysis there there is a dual theorem in which quantities are replaced with dual quantities. Examples are current and voltage or impedance and admittance. *1980*

duality theorem
Theorem which states that if either of two dual linear programming problems has a solution, then so does the other. *1980*

duct geometry
The shape and dimensions of ports or other openings designed for passage of fluids (gases, liquids, or mixtures) in or external to engines. *1979*

ducted fan engines
Aircraft engines incorporating a fan or propeller enclosed in a duct; especially, jet engines in which an enclosed fan or propeller is used to ingest ambient air to augment the gases of combustion in the jetstream. *SP-7 1968*

ducted fans
Fans enclosed in ducts. *SP-7 1968*

ducts
Specifically tubes or passages that confine and conduct fluids, as passages for the flow of air to compressors of gas turbine engines, or pipes leading air to superchargers. *SP-7 1968*

dullness
Use luster

dummy loads
Use impedance

dummy loads
Use output

dump combustors
Combustors having a means of reducing flow velocity and forming recirculation zones through the sudden enlargement area between the inlet duct and the combustion chamber. *1987*

dunes
Low mounds, ridges, banks, or hills of loose, windblown granular material, usually sand, capable of movement. Used for barchans, coastal dunes, and sand dunes. *DOE 1972*

duplex operation
The operation of associated transmitting and receiving apparatus in which the processes of transmission and reception are concurrent. *SP-7 1968*

duplexers
Devices which permit a single antenna system to be used for both transmitting and receiving. Duplexers should not be confused with diplexers, devices permitting an antenna system to be used simultaneously or seperately by two transmitters. *SP-7 1968*

duration
Use time

dwarf galaxies
Galaxies with low luminosity. *1982*

dwarf novae
Short period binary systems in which a red quasi-main sequence star fills its Roche lobe and transfers matter, via an accretion disk, onto a white dwarf. *1981*

dynamic loads
Loads imposed by dynamic action, as distinguished from a static load. Specifically, with respect to aircraft, rockets, or spacecraft, a load due to an acceleration of craft, as imposed by gusts, by maneuvering, by landing, by firing rockets, etc. *SP-7 1968*

dynamic models
Models of aircraft of other objects having their linear dimensions and its weight and moments of inertia reproduced in scale in proportion to the original. *SP-7 1968*

dynamic pressure
The pressure of a fluid resulting from its motion, equal to one half the fluid density times the fluid velocity squared. In incompressible flow, dynamic pressure is the difference between total pressure and static pressure. *SP-7 1968*

dynamic stability
The characteristics of a body, such as an aircraft or rocket, that causes it, when disturbed from an original state of steady flight or motion, to damp the oscillations set up by restoring moments and gradually return to its original state; specifically, the aerodynamic characteristics. *SP-7 1968*

dynamics
Study of the motion of a system of material particles under the influence of forces, especially those which originate outside the system under consideration. *DOE 1968*

Dynamics Explorer satellites
Two satellites that have been designed to occupy different orbits and supply comparative data for studying the boundary region between earth and space. Of the 24 goals of the program, one half require both satellite's data, one fourth one satellite's data and one fourth the other satellite's data. The satellites were launched together in August of 1981. *1981*

Dynamics Explorer 1 satellite
A twin satellite of Dynamics Explorer 2 satellite designed to study the magnetosphere, ionosphere, and atmosphere coupling. *1981*

Dynamics Explorer 2 satellite
A twin satellite of Dynamics Explorer 1 satellite designed to study the magnetosphere, ionosphere, and atmosphere coupling. *1981*

dynamometers
Instruments for measuring power or force; specifically, instruments for measuring the power, torque, or thrust of aircraft engines or rockets. Used for electrodynamometers. *SP-7 1968*

dyspnea
Difficult or labored breathing. *SP-7 1970*

E

E glass
A low alkali lime borosilicate glass made into glass fiber filaments used in composite materials. *1981*

earphones
Electroacoustic transducers operating from an electrical system to an acoustical system and intended to be closely coupled acoustically to the ear. Used for headsets. *SP-7 1968*

earth axis
Any one of a set of mutually perpendicular reference axes established with the upright axis (the Z axis) pointing to the center of the earth, used in describing the position or performance of an aircraft or other body in flight. The earth axes may remain fixed or may move with the aircraft or other object. *SP-7 1968*

earth currents
Use telluric currents

earth figure
Use geodesy

earth hydrosphere
That part of the earth that consists of the oceans, seas, lakes, and rivers. Used for hydrosphere (earth). *SP-7 1968*

earth mantle
The zone of the earth below the crust and above the core (to a depth of 3480 km), which is divided into the upper mantle and the lower mantle, with a transition zone between. Used for mantle (earth structure). *DOE 1968*

earth observations (from space)
The acquisition of earth surface data from aircraft or spacecraft. *1979*

earth observing system (EOS)
NASA's orbital multisensor observatory system for the long term acquisition of earth sciences data to be operated in conjunction with an integrated ground-based science information system. This international system will become operational in 1995 when the first of four polar platforms will be launched. The first and third will be launched under U.S. auspices. The second under ESA auspices and the last under Japanese auspices. *1987*

earth radiation budget experiment
Radiation measurements to determine the spatial and temporal variations of the earth's radiance. The measurements have continued for the past two decades beginning with Explorer 7 in 1959 and through Nimbus 6 and 7. Used for ERBE. *1980*

Earth Resources Technology Satellite C
Use Landsat 3

earth shape
Use geodesy

earth terminal measurement system
NBS system for measuring electromagnetic parameters of communication satellites and ground stations relative to antenna gain, ratio of carrier power to operating noise temperature, and satellite effective isotropic power. *1979*

earth terminals
Portable or stationary ground based equipment used to transmit and receive signals and other data via satellites in communications networks. *1981*

earthquake resistance
Structural strength of natural geological formations reacting to seismic forces. *1980*

earthquake resistant structures
Buildings and other structures designed for maximum safety and protection from the effects of earthquakes. *1977*

echelon faults
Use geological faults

echoencephalography
A diagnostic technique in which pulses of ultrasonic waves are beamed through the head from both sides, and echoes from the midstructures of the brain are recorded as graphic tracings. *1982*

echoes
Waves that have been reflected or otherwise returned with sufficent magnitude and delay to be detected as a wave distinct from that directly transmitted. In radar, a pulse of reflected radiofrequency energy; the appearance on a radar indicator of the energy returned from a target. *SP-7 1968*

eclipses
The reductions in visibility or disappearances of nonluminous bodies by passing into the shadows cast by another nonluminous body. The apparent cutting off, wholly or partially, of the light from a luminous body by a dark body coming between it and the observer. *SP-7 1968*

ecliptic
The apparent annual path of the sun among the stars; the intersection of the plane of the earth's orbit with the celestial sphere. The eliptic is a great circle of the celestial sphere inclined at an angle of about 23 degrees 27 minutes to the celestial equator. *SP-7 1968*

ecological systems
Use ecology

ecology
The study of the environmental relations of organisms. Used for ecological systems. *SP-7 1968*

econometrics
The application of mathematics and statistical techniques to the testing and quantifying of economic theories and the solution of economic problems. *1977*

economic impact
The impact on the economy from whatever cause. *1977*

eddies
Use vortices

eddy viscosity
The turbulent transfer of momentum by eddies giving rise to an internal fluid friction, in a manner analogous to the action of molecular viscosity in laminar flow, but taking place on a much larger scale. *SP-7 1969*

Einstein Observatory
Use HEAO 2

EISCAT radar system (Europe)
The European Incoherent Scatter Radar system. Used for European Incoherent Scatter Radar. *1977*

ejecta
Matter ejected during impact cratering processes, usually meteoritic. *1978*

ejectors
Devices consisting of a nozzle, mixing tube, and diffuser utilizing the kinetic energy of a fluid from a low pressure region by direct mixing and ejecting both streams. *SP-7 1968*

Ekman layer
The layer of transition between the surface boundary layer of the atmosphere, where the shearing stress is constant, and the free atmosphere, which is treated as an ideal fluid in approximate geostrophic equilibrium. *1982*

elastic constants
Use elastic properties

elastic modulus
Use modulus of elasticity

elastic properties
Properties of materials by virtue of which they tend to recover their original size and shape immediately after removal of the forces causing deformation. Used for elastic constants and elasticity. *ASTM (D 123, D-13) 1968*

elastic stability
Use damping

elasticity
Use elastic properties

elastomers
Macromolecular materials which, at room temperature,are capable of recovering substantially in size and shape after removal of a deforming force. *ASTM (D 907, D-14) 1968*

Elber equation
In fatigue crack propagation studies, the effective stress range ratio $U = 0.5 + 0.4R$, where R is the stress ratio. *1980*

electric circuits
Use circuits

electric corona
A luminous, and often audible, electric discharge that is intermediate in nature between a spark discharge (with, usually, its single discharge channel) and a non point discharge (with its diffuse, quiescent, nonluminous character). Used for corona discharges. *SP-7 1968*

electric discharges
The flowing of electricity through a gas, resulting in the emission of radiation that is characteristic of the gas and the intensity of the current. *SP-7 1968*

electric furnaces
Furnaces whose heat is derived from electrical energy, generally achieved through resistance heating. Materials research and space processing are research uses. *1983*

electric hybrid vehicles
Surface vehicles which utilize propulsion systems of both electric motors and conventional internal combustion engines. *1978*

electric potential
In electrostatics, the work done in moving unit positive charge from infinity to the point whose potential is being specified. Used for voltage. *SP-7 1968*

electric propulsion
A general term encompassing all the various types of propulsion in which the propellant consists of charged electrical particles which are accelerated by electrical or magnetic fields, or both; for example, electrostatic propulsion, electromagnetic propulsion, and electrothermal propulsion. *SP-7 1968*

electroacoustic transducers
Transducers for receiving waves from an electric system and delivering waves to an acoustic system, or vice versa. Microphones and earphones are electroacoustic transducers. *SP-7 1968*

electrochemical cells
Electrochemical systems consisting of an anode and a cathode in metallic contact and immersed in an electrolyte. (The anode and cathode may be different metals or dissimilar areas on the same metal surface). *ASTM (G 15, G-1) 1968*

electrochemistry
The branch of science and technology which deals with transformations between chemical and electrical energy. *ASTM (B 374, B-8) 1968*

electrochromism
A phenomenon whereby a select number of solid materials will change color when an electric field is applied. *1984*

electrodes
Terminals at which electricity passes from one medium into another. The positive electrode is called the anode; the negative electrode is called the cathode. In a semiconductor device, an element that performs one or more of the functions of emitting or collecting electrons or holes, or of controlling their movements by an electric field. In electron tubes, a conducting element that performs one or more of the functions of emitting, collecting or controlling, by an electromagnetic field, the movements of electons or ions. *SP-7 1968*

electrodynamics
The science dealing with the forces and energy transformations of electric currents and the magnetic fields associated with them. *SP-7 1968*

electrodynamometers
Use dynamometers

electroepitaxy
Crystal growth process achieved by passing an electric current through the substrate solution. *1980*

electrojets
Laterally limited relatively intense electric currents located in the ionosphere. *SP-7 1968*

electroless deposition
Controlled autocatalytic reduction method of depositing coatings. *1980*

electroluminescence
Emission of light caused by an application of electric fields to solids or gases. In gas electroluminescence, light is emitted when the kinetic energy of electron or ions accelerated in an electric field is transferred to the atoms or molecules of the gas in which the discharge takes place. Used for electroluminescent lamps. *SP-7 1968*

electroluminescent lamps
Use electroluminescence

electrolysis
The production of chemical changes by the passage of current through an electrolyte. *ASTM (B 374, B-8) 1980*

electrolytic cells
Unit apparatus in which electrochemical reactions are produced by applying electrical energy, or which supply electrical energy as a result of chemical reactions and which include two or more electrodes and one or more electrolytes contained in a suitable vessel. Used for galvanic cells. *ASTM (B 374, B-8; C 859, C-26)1968*

electrolytic polishing
Use electropolishing

electromagnetic acceleration
The use of perpendicular components of electric and magnetic fields to accelerate a current carrier. *1981*

electromagnetic control
Use remote control

electromagnetic environment experiment
Shuttleborne radio frequency experiment. *1981*

electromagnetic radiation
Energy propagated through space or through material media in the form of an advancing disturbance in electric and magnetic fields existing in space or in media. The term radiation, alone, is used commonly for this type of energy, although it actually has a broader meaning. Used for electromagnetic waves and wave radiation. *SP-7 1968*

electromagnetic spectra
Spectra of known electromangetic radiations, extending from the shortest cosmic rays, through gamma rays, x rays, ultraviolet radiation, visible radiation, and including microwave and all other wavelengths of radio energy. *SP-7 1968*

electromagnetic waves
Use electromagnetic radiation

electromagnetics
Use electromagnetism

electromagnetism
Magnetism produced by an electric current. The science dealing with the physical relations between electricity and magnetism. Used for electromagnetics. *SP-7 1968*

electrometers
Instruments for measuring differences of electric potential. *SP-7 1968*

electromotive forces
Forces capable of maintaining a potential difference, and thus a current, within a circuit. They can be established by chemical action or by mechanical work. *DOE 1968*

electromyograms
Use electromyography

electromyographs
Use electromyography

electromyography
The study of the response of a muscle to an electric stimulation. Used for electromyograms and electromyographs. *SP-7 1968*

electron acceleration
The acceleration of electrons by action of solar cosmic rays. *1980*

electron avalanche
The process in which a relatively small number of free electrons in a gas that is subjected to a strong electric field accelerate, ionize gas atoms by collision, and thus form new free electrons to undergo the same process in cumulative fashion. *SP-7 1968*

electron beams
Specifically, focused streams of electrons used for neutralization of the positively charged ion beam in a ion engine. Also used to melt or weld materials with externally high melting points.
SP-7 1968

electron cyclotron heating
A type of radio frequency plasma heating in which high-power microwave energy is introduced into the plasma region. *1978*

electron diffraction
The phenomenon, or the technique of producing diffraction patterns through the incidence of electrons as a function of kinetic energy.
ASTM (E 7, E-4) 1968

electron flux
Use flux (rate)

electron guns
Electrode structures which produce and may control, focus, deflect, and converge one or more electron beams. *SP-7 1968*

electron ionization
Use ionization

electron microscopy
The interpretive application of an electron microscope for the magnification of materials that cannot be properly seen with an optical microscope. *1976*

electron multipliers
Use photomultiplier tubes

electron optics
The science that deals with the propagation of electrons, as light optics deals with light and its phenomena.
ASTM (E 7, E-4; E 175, E-25) 1968

electron paths
Use electron trajectories

electron probes
Narrow beams of electrons used to scan or illuminate an object or screen. *ASTM (E 7,E-4) 1968*

electron runaway (plasma physics)
High acceleration of electrons in a collisional plasma caused by a suddenly applied electric field (which greatly reduces the collision cross section of the electrons). *1979*

electron spectroscopy
The study and interpretation of atomic, molecular, and solid state structure based on x ray induced electron emission from substances. *1977*

electron trajectories
The paths of electrons. Used for electron paths.
ASTM (E 7, E-4) 1968

electron tubes
Devices in which conduction by electrons takes place through a a vacuum of gaseous medium within a gastight envelope. *SP-7 1968*

electron-hole drops
Exciton condensations exhibiting the properties of electrically conducting plasmas which form in germanium and silicon crystals at sufficiently low cryogenic temperatures. *1980*

electronic aircraft
Designation for tactical electronic warfare aircraft. *1979*

electronic amplifiers
Use amplifiers

electronic equipment
Equipment in which electricity is conducted principally by electrons moving through a vacuum, gas, or semiconductor. *SP-7 1968*

electronic levels
Use energy levels

electronic warfare
Military action involving the use of electromagnetic energy to determine, exploit, reduce, or prevent hostile use of the electromagnetic spectrum, and action which retains friendly use of the electromagnetic spectrum. *1981*

electronics
That branch of physics that treats of the emission, transmission, behavior, and effects of electrons. Used for photoelectronics.
SP-7 1968

electrophoresis
The movement of colloidal particles produced by the application of an electric potential. Used for continuous flow electrophoresis.
ASTM (B 374, B-8) 1968

electropolishing
The improvement in surface finish of a metal effected by making it anodic in an appropriate solution. Used for electrolytic polishing.
ASTM (E 7, E-4) 1968

electroseismic effect
Use seismic waves

electrostatic bonding
Use of the particle-attracting property of electrostatic charges to bond particles of one charge to those of the opposite charge.
1980

electrostatic plasma
Use plasmas (physics)

electrostriction
The phenomenon wherein some dielectric materials experience an elastic strain when subjected to an electric field, this strain being independent of polarity of the field. *SP-7 1968*

electrowinning
The production of metals by electrolysis with insoluble anodes in solutions derived from ores or other materials.
ASTM (B 374, B-8) 1968

ellipses
Plane curves constituting the locus of all points the sum of whose distances from two fixed points called focuses or foci is constant; an elongated circle. *SP-7 1968*

ellipsoids
Surfaces whose plane sections (cross sections) are all ellipses or circles, or the solid enclosed by such a surface. Used for Izsak ellipsoid. *SP-7 1968*

ellipsometers
Instruments for determining the ellipticity of polarized light. Used to measure the thickness of very thin transparent films. *DOE 1968*

elliptical plasmas
Confined non-circular plasmas. *1980*

elliptical polarization
The polarization of a wave radiated by an electric vector rotating in a plane and simultaneously varying in amplitude so as to describe an ellipse. *SP-7 1968*

ellipticity
The amount by which a spheroid differs from a circle, calculated by dividing the difference in the length of the axes by the length of the major axis. *SP-7 1968*

embedded computer systems
Computer systems physically incorporated into larger systems whose primary function is not data processing. *1982*

embolisms
Large amounts of air in the blood stream which, when reaching the heart, cause it to fail; small amounts are resorbed and cause no symptoms. *SP-7 1968*

embossing
Raising in relief on a surface. *1981*

embrittlement
The severe loss of ductility or toughness or both, of a material, usually a metal or alloy. *ASTM (G 15, G-1) 1968*

emergency locator transmitters
Aircraft distress signal equipment with a radio beacon on a specific emergency frequency and used for locating downed aircraft. The set is activated by the impact of the crash. *1980*

emission spectra
The spectra of wavelengths and relative intensities of electromagnetic radiation emitted by a given radiator. Each radiating substance has a unique, characteristic emission spectrum, just as every medium of transmission has its individual aborption spectrum. *SP-7 1968*

emissivity
A property of a material, measured as the emittance of a specimen of the material that is thick enough to be completely opaque and has an optically smooth surface. Used for photoemissivity. *SP-7 1968*

emissographs
Use actinometers

empennage
Use tail assemblies

emulsions
Suspensions of fine particle or globules of one or more liquids in another liquid. *ASTM (B 374, B-8; D 459, D-12; E 609, E-35) 1968*

enamels
Thin ceramic coatings, usually of high glass content, applied to a substrate, generally a metal. *SP-7 1968*

encapsulated microcircuits
Microelectronic circuits enclosed in plastic. *1977*

Enceladus
A satellite of Saturn orbiting at a mean distance of 238,000 kilometers. *SP-7 1975*

Encke comet
A very faint comet with a periodicity of 3.3 years which is the shortest of any known comet. *1982*

end-to-end data systems
Comprehensive data systems which demonstrate the processing of sensor data to the user thus reducing data fragmentation. *1982*

endangered species
Living organisms (except plants) whose populations have diminished to such low levels that survival may require extraordinary conservation procedures. Changes in size and quality of the ecology are considered the cause of the possible extinction of some species. *1980*

energetic particles
Charged particles having energies equaling or exceeding a hundred Mev. *1978*

energy
Any quantity with dimensions which can be represented as mass times length squared divided by time squared. *SP-7 1968*

energy budgets
Quantitative descriptions of the total energy exchange into and out of a given physical or ecological system; may include radiation heat, kinetic, and biological process. *1968*

energy density
Use flux density

energy efficiency transport program
Use ACEE program

energy gaps (solid state)
A range of forbidden energies in the band theory of solids. Used for bandgap. *1977*

energy levels
Any one of different values of energy which a particle, atom, or molecule may adopt under conditions where the possible values are restricted by quantizing conditions. Used for electronic levels. *SP-7 1968*

engine airframe integration
Physics of the interface between the engine and the airframe. *1982*

engine control
Any control for regulating the power and speed of an engine, such as the throttle, mixture control, manifold pressure regulator, fuel pressure control, or supercharger control. *SP-7 1968*

engine coolants
Liquids used in an engine cooling system to transfer heat from the engine to the radiator. *ASTM (D 2825, D-21; D 2847, D-15) 1968*

engines
Machines or apparatus that convert energy, especially heat energy, into work. Used for gas generator engines. *SP-7 1968*

enthalpy
A mathematically defined thermodynamic function of state. Used for heat content. *SP-7 1968*

entropy
A measure of the extent to which the energy of a system is unavailable. *SP-7 1968*

entropy (statistics)
A factor or quantity that is a function of a mechanical system and is equal to the logarithm of the probability of the particular arrangement in that state. *1980*

entry guidance (STS)
The precise steering commands for trajectory from initial penetration of the earth's atmosphere until the terminal area guidance is activated at an earth-relative speed (about 2500 fps). *1980*

environmental chambers
Use test chambers

environmental chemistry
Collective term comprising the complex chemical relationships involving the atmosphere, climatology, air and water pollution, fuels, pesticides, energy, biochemistry, geochemistry, etc. *1980*

environmental temperature
Use ambient temperature

environments
External conditions or the sum of such conditions, in which pieces of equipment, living organisms, or systems operate as in temperature environment, vibration environment, or space environment. Environments are usually specified by a range of values, and may be either natural or artificial. *SP-7 1968*

eosinophils
A type of white blood cell or leukocyte which stains a red color with eosin stain; normally about 2 to 3 percent of white cells in the blood but tending to decrease during stressful situations and thus usable as an index for stress. *SP-7 1968*

ephemerides
Periodical publications tabulating the predicted positions of celestial bodies at regular intervals, such as daily, and containing other data of interest to astronomers. A publication giving similar information useful to a navigator is called an almanac. *SP-7 1968*

ephemeris time
The uniform measure of time defined by the laws of dynamics and determined in principle from the orbital motions of the planets, specifically the orbital motion of the earth as represented by Newcomb's Tables of the Sun. *SP-7 1968*

epitaxy
The oriented growth of a crystalline substance on a substrate of the same or different cystalline substance. *ASTM (F 127, F-1) 1968*

epoxy matrix composites
High strength compositions consisting of epoxy resin and a reinforcing matrix of filaments or fibers of glass, metal, or other materials. *1980*

epoxy resins
Viscous liquids or brittle solids containing epoxide groups that can be crosslinked into final form by means of a chemical reaction with a variety of setting agents used with or without heat. *ASTM (C 904, C-3) 1968*

equations of motion
A set of equations which give information regarding the motion of a body or of a point in space as a function of time when initial position and initial velocity are known. Used for motion equations. *SP-7 1968*

equations of state
Equations relating temperature, pressure, and volume of a system in thermodynamic equillibrium. Used for state equations. *SP-7 1968*

equatorial atmosphere
The composition and characteristics of the earth's atmosphere at and/or near the equator. *1978*

equatorial regions
Areas on or near the earth's equator; regions between the Tropic of Cancer and the Tropic of Capricorn (23 degrees 27 minutes North or South of the Equator). *1980*

equators
The primary great circle of a sphere or spheroid, such as the earth, perpendicular to the polar axis; or a line resembling or approximating such a circle. *SP-7 1968*

equilibrium
A state of dynamic balance between the opposing actions, reactions, or velocities of a reversible process. *ASTM (E 7, E-4) 1968*

equilibrium flow
Gas flow in which energy is constant along streamlines and the composition of the gas at any point is not time dependent. Used for steady state flow. *SP-7 1968*

equinoxes
One of two points of intersection of the ecliptic and the celestial equator occupied by the sun when its declination is zero degrees. *SP-7 1968*

ERBE
Use earth radiation budget experiment

ergometers
Instruments for measuring muscular work. *SP-7 1968*

ergonomics
Use human factors engineering

erosion
Progressive loss of original material from a solid surface due to mechanical interaction between that surface and a fluid, a multicomponent fluid, or impinging liquid or solid particles. Used for scars (geology). *ASTM (G 76, G-2) 1968*

erosive burning
Combustion of solid propellants accompanied with nonsteady, high velocity flows of product gases across burning propellant surfaces. *1980*

error band
Use accuracy

error signals
Voltages the magnitude of which are proportional to the difference between an actual and a desired position. *SP-7 1968*

errors
In mathematics, the difference between the true value and a calculated or observed value. Use for invalidity. *SP-7 1968*

ERS-1 (ESA satellite)
A European Space Agency remote sensing satellite designed to monitor global oceans, coastal zones and polar regions. It is scheduled for launch on an Ariane 4 expendable launch vehicle in 1990. *1982*

ERTS-C
Use Landsat 3

ESA spacecraft
Spacecraft of the European Space Agency. *1982*

escape
Of a particle of large body: to achieve an escape velocity and a flightpath outward from a primary body so as neither to fall back to the body nor to orbit it. *SP-7 1969*

escape rockets
Small rockets engines attached to the leading end of an escape tower, which may be used to provide additional thrust to the capsule to obtain separation of the capsule from the booster vehicle in an emergency. *SP-7 1968*

escape velocity
The radial speed which a particle of larger body must attain in order to escape from the gravitational of a planet, satellite, or star. Used for parabolic velocity. *SP-7 1968*

estimating
A procedure for making a statistical inference about the numerical values of one or more unknown population parameters from the observed values in a sample.
ASTM (E 206, E-9; D 2188, D-20) 1968

etalons
Two adjustable parallel mirrors mounted so that either one may serve as one of the mirrors in a Michelson interferometer; used to measure distance in terms of wavelengths of spectral lines.
1987

ethics
The standards of conduct and moral judgement of a group, religion, profession, etc. *1980*

ethnic factors
The complex patterns of behavior which distinguish an ethnic group. *1979*

etiology
The doctrine of causes, particularly the causes and reasons for diseases. *SP-7 1968*

Eureca (ESA)
A Space Shuttle launched retrievable autonomous space platform being developed by the European Space Agency. First launch is scheduled for 1991 with first retrieval 6 months later. Used for European Retrievable Carrier. *1983*

Europa
A satellite of Jupiter orbiting at a mean distance of 671,000 kilometers. Also called Jupiter II. *SP-7 1968*

European Incoherent Scatter Radar
Use EISCAT radar system (Europe)

European Large Telecomm Satellite
Use L-Sat

European Retrievable Carrier
Use Eureca (ESA)

eutectic composites
Composite materials with a metal matrix of a mixture of solids including eutectoids. *1980*

EUVE
Use extreme ultraviolet Explorer satellite

evacuating (transportation)
The organized withdrawal or removal of people from a place or area as a protective measure. *DOE 1968*

evaporation
The physical process by which a liquid or solid is transformed into the gaseous state; the opposite of condensation. *SP-7 1968*

evaporation rate
The mass of material evaporated per unit time from unit surface of a liquid or solid. The number of molecules of a given substance evaporated per second per square centimeter from the free surface of the condensed phase. *SP-7 1968*

exactness
Use precision

excimer lasers
Molecular lasers using vibronic transitions whose lasing medium is a dimer that exists in the excited state and dissociates in the ground state. *DOE 1979*

excimers
Molecules characterized by repulsive or very weakly bound ground electronic states. *1978*

excitation
Addition of energy to a nuclear, atomic or molecular system transferring it to another energy state. Used for excited states.
DOE 1968

excited states
Use excitation

executive systems (computers)
Use operating systems (computers)

exhaust clouds
Clouds formed from the exhaust aerosols of launch vehicle engines and boosters at liftoff. Used for ground clouds and launch clouds.
1988

exhaust emission
The movement of gaseous of other particles and radiation from the nozzle of a rocket or other reaction engine. *1979*

exhaust velocity
The velocity of gases or particles (exhaust stream) that exhaust through the nozzle or a reaction engine, relative to the nopzzle.
SP-7 1968

exobiology
That field of biology which deals with the effects of extraterrestrial environments on living organisms and with the search for extraterrestrial life. Used for astrobiology and space biology.
SP-7 1968

exosphere
The outermost, or topmost, portion of the atmosphere. Its lower boundary is the critical level of escape, variously estimated at 500 to 1000 kilometers above the earth's surface. *SP-7 1968*

expert systems
Computer programs that manipulate symbolic information to produce the same results as human experts would. They deal with uncertain data and make decisions on that data. Input and design relies on human experts. Used for knowledge engineering. *1983*

exploding conductor circuits
Use circuits

Explorer 44 satellite
The tenth in a series of solar radiation monitoring satellites launched from Wallops Island, VA on July 8, 1971, to measure x rays and ultraviolet radiation from the sun. It was operational until June 3, 1978. Used for Solrad 10 satellite. *1982*

Explorer 45 satellite
One in a long series of NASA scientific satellites used to study the atmosphere, ionosphere, magnetosphere, interplanetary space, etc. *1977*

Explorer 46 satellite
A satellite designed to study meteoroid protective ability of spacecraft launched from Wallops Island, VA on August 13, 1972. Two scientific experiments also on board were to determine the size and the velocity of meteoroids. The velocity experiment failed to work due to excessive heat. Used for Meteoroid Technology Satellite. *1982*

Explorer 52 satellite
The Hawkeye 1 satellite in the Explorer series. Used for Hawkeye 1 satellite. *1978*

explosion suppression
Any method used to confine or suppress an explosion. *1981*

explosions
The sudden production of large quantities of gases, usually hot, *from much smaller amounts of gases, liquids, or solids.* *SP-7 1968*

EXPOS (Spacelab payload)
X ray spectropolarimetry payload for Spacelab. Used for X Ray Spectropolarimetry Payload. *1977*

extars
Use x ray stars

extended duration space flight
Use long duration space flight

extensometers
Devices for determining the elongation of a specimen as it is strained. Used for dilatometers. *ASTM (D 1566, D-11) 1968*

extragalactic light
Use extraterrestrial radiation
light (visible radiation)

extraterrestrial intelligence
Intelligent life existing elsewhere than on earth. *1978*

extraterrestrial life
Life forms evolved and existing outside the terrestrial biosphere. *SP-7 1968*

extraterrestrial radiation
In general, solar radiation received just outside the earth's atmosphere. Used for extragalactic light, space radiation, and stellar Doppler shift. *SP-7 1968*

extreme ultraviolet Explorer satellite
An Explorer satellite carrying scientific instruments for scanning the sky in the 100-900 Angstrom region of the spectrum to study the very hot celestial bodies (white dwarfs, for example). Used for EUVE. *1980*

extreme ultraviolet radiation
Ultraviolet emission in the 100-1000 Angstrom range. *1980*

extremum values
In statistics, the upper or lower bound of the random variable which is not expected to be exceeded by a specified percentage of the population within a given confidence interval. *SP-7 1968*

F

Fabry-Perot lasers
Use lasers

factorization
Process or instance of factoring. *1981*

faculae
Large patches of bright material forming a veined network in the vicinity of sunspots. They appear to be more permanent than sunspots and are probably due to elevated clouds of luminous gas. Used for plages (faculae) and solar faculae. *SP-7 1968*

fail-safe systems
Systems used to minimize risk in case of malfunction. *SP-7 1968*

faint object camera
One of the five components of the first scientific payload of the *Hubble Space Telescope. The faint object camera will be used* to observe extremely faint astronomical objects with wavelengths between 120 and 700 nm. *1981*

false alarms
In general, the unwanted detection of input noise. In radar, an indication of a detected target even though one does not exist, due to noise or interference levels exceeding the set threshold of detection. *1986*

fan blades
One or more revolving vanes attached to a rotary hub and operated by a motor. *1980*

fast neutrons
Neutrons of energy exceeding some threshold that must be specified (typically 0.1 or MeV); often associated with those neutrons predominately responsible for displacement damage of materials in neutron radiation fields. *ASTM (E 170, E-10) 1968*

fatigue (biology)
State of the human organism after exposure to any time of physical or psychological stress (e.g. pilot fatigue). *SP-7 1968*

fatigue (materials)
A weakening or deterioration of metal or other material occurring under load, especially under repeated cyclic, or continued loading. Used for strain fatigue and structural fatigue. *SP-7 1968*

fatigue life
The number of cycles of stress or strain of a specified character that a given specimen sustains before failure of a specified nature occurs. *ASTM (D 671, D-20; E 206, E-9) 1968*

fault tolerance
The capability of systems to function despite one or more critical failures, by use of redundant circuits or functions and/or reconfigurable elements. *1980*

fault trees
Acyclic directed graphs used in the analysis or prediction of faults and defects. *1979*

FDMA
Use frequency division multiple access

feedback
The return of a portion of the output of a device to the input; positive feedback adds to the input, negative feedback subtracts from the input. Information such as progress or results. returned to an originating source. In aeronautics, the transmittal of forces initiated by aerodynamic action on control surfaces or rotor blades to the cockpit controls; the forces so transmitted. *SP-7 1968*

feet (anatomy)
The lower, pedal, extremeties of the legs. *1977*

feldspars
A group of abundant rock-forming minerals of the family of anhydrous silicates. *DOE 1968*

felsite
A light colored, fine grained igneous rock composed chiefly of quartz or feldspar. *1976*

Fermat principle
The principle which states that the path along which electromagnetic radiation travels between any two points will be that path for which the elapsed time for the travel is a minimum. *SP-7 1968*

Fermi-Dirac statistics
The statistics of an assembly of identical half-integer spin particles; such particles have wave functions antisymmetrical with respect to particle interchange and satisfy the Pauli exclusion principle. *1976*

ferrites
Solid solutions of carbon in alpha-iron. *DOE 1968*

ferrography
A technique for the isolation and analysis of wear particles in a lubricant. *1981*

fiber composites
Structural materials consisting of combinations of metals or alloys or plastics reinforced with one or more types of fibers. *1979*

fiber optics
The technique of transmitting light through long thin, flexible fibers of glass, plastic, or other transparent materials. *DOE 1968*

fiber release
The release of carbon or graphite when graphite reinforced composites are burned, especially in aircraft crashes or fires. *1980*

fidelity
Use accuracy

field of view
The area or solid angle that can be viewed through or scanned by an optical instrument. *1980*

field strength
For any physical field, the flux density, intensity, or gradient of the field at the point in question. *SP-7 1968*

filaments (solar physics)
Use solar prominences

film cooling
The cooling of a body or surface, such as the inner surface of a rocket combustion chamber, by maintaining a thin fluid layer over the affected area. *SP-7 1968*

fineness ratio
The ratio of the length of a body to its maximum diameter, or, sometime to some equivalent dimension -- said especially of a body such as an airship hull or rocket. *SP-7 1968*

finite impulse response filters
Use FIR filters

finite volume method
A moving mesh method for analyzing transonic flow over airfoils. *1981*

fins
Fixed or adjustable airfoils or vanes attached longitudinally to an aircraft, rocket, or a similar body to provide a stabilizing effect. Also, a flat plate of structure, as a cooling fin. Used for vertical fins. *SP-7 1968*

fiords
Arms of the sea having steep sides, deep bottoms, and shallow sills separating them from the sea. *DOE 1973*

FIR filters
Physically unrealizable nonrecursive digital filters. Used for finite impulse response filters. *1980*

fire resistance
Use flammability

fireflies
Flying insects which produce light by bioluminescence. *1977*

firmware
Hardwired software which often encompasses microcodes. *1984*

fisheries
Place for harvesting fish or other aquatic life, especially in sea waters. *1977*

fissile materials
Use fissionable materials

fission
The splitting of an atomic nucleus into two more-or-less equal fragments. *SP-7 1968*

fissionable materials
Materials containing nuclides capable of undergoing fission only by fast neutrons with energy greater than 1MeV, e.g., thorium-232 and uranium-238. Used for fissile materials. *DOE 1968*

fissures (geology)
Extensive cracks in rocks. *1980*

fixed points (mathematics)
Positional notation in which corresponding places in different quantities are occupied by coefficients of the same power of the base. Notation in which the base point is assumed to remain fixed with respect to one end of the numeric expressions. *SP-7 1968*

flame deflectors
In a vertical launch, any of variously designed obstructions that intercept hot gases of rocket engines so as to deflect them away from the ground or from a structure. In captive tests, elbows in the exhaust conduits or flame buckets that deflect the flame into the open. *SP-7 1968*

flame quenching
Use quenching (cooling)

flammability
Those characteristics of a material that pertain to its relative ease of ignition and relative ability to sustain combustion. Used for combustibility and fire resistance. *ASTM (D 123, D 3659, D 4391; D-13) 1968*

flaperons
Airplane control surfaces that serve the function of both aileron and flap. *1982*

flare stars
Members of a class of dwarf stars that show sudden intensive outbursts of energy. Used for UV Ceti stars. *1978*

flash point
The temperature at which a substance, such as fuel oil, will give off a vapor that will flash or burn momentarily when ignited. *SP-7 1968*

flashback
Backward burning of a flame into the lip of a burner or torch. *DOE 1968*

flashing (vaporizing)
The evaporation of a heated liquid as a consequence of rapid pressure reduction. *DOE 1968*

flat patterns
Shape of a part or parts put in 3 space in its undefined condition. *1981*

flavor (particle physics)
The specific identifiers of quarks which distinguish various combinations of electric charge and mass. *1982*

fleet satellite communication system
Global communication system utilizing satellites. Used for FLEETSATCOM and FLTSATCOM. *1979*

FLEETSATCOM
Use fleet satellite communication system

flexibility
That property of a material by virtue of which it may be flexed or bowed repeatedly without undergoing rupture. Used for nonrigidity. *ASTM (D 123, D-13) 1968*

flexible spacecraft
Space vehicles (usually space structures or rotating satellites) whose surfaces and/or appendages may be subject to elastic flexural deformations (vibrations). *1980*

flight
The movement of an object through the atmosphere or through space, sustained by aerodynamic, aerostatic, or reaction forces, or by orbital speed; especially, the movement of a man operated or man controlled device, such as a rocket, a space probe, a space vehicle, or an aircraft. Used for flying, high altitude flight, and high speed flight. *SP-7 1968*

flight characteristics
Characteristics exhibited by an aircraft, rocket, or the like in flight, such as a tendancy to stall or to yaw, or an ability to remain stable at certain speeds. Used for flight performance and flying qualities. *SP-7 1968*

flight envelopes
The bounds within which a certain flight system can operate, especially a graphic representation of these bounds showing interrelationships of operational parameters. *1987*

flight operations
Collective term for ground support operations by flight crew or support personnel preparatory to space flight, or tasks performed by crew during flight. *1978*

flight paths
Paths made or followed in the air or in space by an aircraft or rocket; the continuous series of positions occupied by a flying body; more strictly, the path of the center of gravity of the flying body, referred to the earth or other fixed reference. *SP-7 1968*

flight performance
Use flight characteristics

flight simulators
Training devices or apparatus that simulate certain conditions of flight or of flight operations. *SP-7 1968*

flight test vehicles
Test vehicles for the conduct of flight tests either to test its own capabilities or to carry equipment requiring flight tests. *SP-7 1968*

flight tests
Tests by means of actual or attempted flight to see how an aircraft, spacecraft, space-air vehicle, or missile flies. Tests of a component part of a flying vehicle, or of an object carried in such a vehicle, to determine its suitability or reliability in terms of its intended function by making it endure actual flight. *SP-7 1968*

flip-flops
Devices having two stable states and two input terminals (or types of input signals) each of which corresponds with one of the two states. The circuits remain in either state until caused to change to the other state by application of the corresponding signal. Similar bistable devices with an input which allows it to act as a single-stage binary counter. Used for bistable amplifiers. *SP-7 1968*

FLIR detectors
Forward-looking infrared detectors for sensing all emissions of heat or light. Used for forward looking infrared detectors. *1977*

flow
A stream or movement of air or other fluid, or the rate of fluid movement, in the open or in a duct, pipe, or passage; specifically an airflow. *SP-7 1968*

flow charts
Graphical representations of sequences of operations using symbols to represent the operations. Flow charts are more detailed representations than diagrams. *SP-7 1968*

FITSATCOM
Use fleet satellite communication system

flue gases
Gaseous combustion products from a furnace. *1982*

fluid filled shells
Shells of revolution containing a gas or liquid. *1981*

fluid management
The isolation and separation of liquids from gas in a storage vessel which operates in a reduced or zero gravity environment using liquid acquisition devices such as those used in the Space Shuttle RCS tankage. *1982*

fluid transpiration
Use transpiration

fluid-solid interactions
The interactions of a rigid or elastic structure with an incompressible or compressible fluid. Airblast loading and response, acoustic interaction, aeroelasticity, and hydroelasticity comprise its major divisions. *1982*

fluorescence
Emission of light or other radiant energy as a result of and only during absorption of radiation of a different wavelength from some other source. Used for fluorescent emission. *SP-7 1968*

fluorescent emission
Use fluorescence

fluorocarbons
All compounds containing fluorine and carbon (including other elements). *1985*

fluoroplastics
Use fluoropolymers

fluoropolymers
A family of polymers based on fluorine replacement of hydrogen atoms in hydrocarbon molecules. Compounds are characterized by chemical inertness, thermal stability, and low coefficient of friction. Used for fluoroplastics. *1978*

flutter
An aeroelastic self excited vibration in which the external source of energy is the airstream and which depends on the elastic, inertial and dissipative forces of the system in addition to the aerodynamic forces. Used for aerodynamic buzz and aeromagneto flutter. *SP-7 1968*

flux
The rate of flow of some quantity, often used in reference to the flow of some form of energy. In nuclear physics generally, the number of radioactive particles per unit volume times their mean velocity. *SP-7 1968*

flux (rate per unit area)
Use flux density

flux (rate)
The total emanation of energy, material or particles from a single source per unit time. Used for electron flux, neutron flux, and particle flux. *1968*

flux density
The flux (rate of flow) of any quantity, usually a form of energy, through a unit area of specified surface. (Note that this is not a volumetric density like radiant density). Used for density (rate/area), energy density, flux (rate per unit area), and flux mapping. *SP-7 1968*

flux mapping
Use flux density

flux pinning
In superconductors, the interaction between the magnetic and the metallurgical microstructures. It controls the critical current density in a given superconducting material. *1985*

flux pumps
Cryogenic dc generators. *DOE 1971*

flux vector splitting
The splitting of the nonlinear flux vectors of the conservation law form of the inviscid gasdynamic equations into subvectors by similarity transformations so that each subvector has associated with it a specified eigenvalue spectrum. *1987*

fly ash
Fine particulate, essentially noncombustible refuse, carried in a gas stream from a furnace. *1982*

fly by tube control
A fluidic flight control for aircraft in which a hydraulic control signal link connects the pilot's controls to the control surface actuators. *1977*

flyby missions
Interplanetary missions in which the vehicle passes close to the target planet but does not impact it or go into orbit around it. *SP-7 1968*

flying
Use flight

flying qualities
Use flight characteristics

FM/PM (modulation)
Phase modulation of a carrier by subcarrier(s) which is (are) frequency modulated by information. *SP-7 1968*

focal plane arrays
Use focal plane devices

focal plane devices
Radiation sensitive devices positioned at the focal area of electromagnetic detectors. Used for focal plane arrays. *1987*

fog
A loose term applied to visible aerosols in which the dispersed phase is liquid. Formation by condensation is usually implied. In meteorology, a dispersion of water or ice.
ASTM (D 1356, D-22) 1968

food chain
The scheme of feeding relationships by trophic levels which unites member species of a biological community. *1980*

food processing
The transformation of foodstuffs into forms for easy packaging, greater palatability, longer storage, etc. *1980*

footprints
Ground patterns or contours of an acoustical or microwave nature that are predictable and measurable. *1982*

Forbush decreases
The observed decreases in cosmic ray activity in the earth's atmosphere about a day after a solar flare. Used for Forbush effect. *SP-7 1968*

Forbush effect
Use Forbush decreases

force
The cause of the acceleration of material bodies measured by the rate of change of momentum produced on a free body. Used for repulsion. *SP-7 1968*

force vector recorders
Instrumentation for recording force displacements in a variety of disciplines. *1977*

forced oscillation
Use forced vibration

forced vibration
An oscillation of a system in which the response is imposed by the excitation. If the excitation is periodic and continuing, the oscillation is steady state. Used for forced oscillation and forced vibratory motion equations. *SP-7 1968*

forced vibratory motion equations
Use forced vibration

form perception
Use space perception

forward looking infrared detectors
Use FLIR detectors

forward scattering
The scattering of radiant energy into the hemisphere of space bounded by a plane normal to the direction of the incident radiation and lying on the side toward which the incident radiation was advancing; the opposite of backward scatter. *SP-7 1968*

fossil meteorite craters
Use fossils

fossils
Remains, traces, or imprints of an organism preserved in the earth's crust some time in the geologic past. Used for fossil meteorite craters. *DOE 1968*

Fourier analysis
The representation of physical or mathematical data by the use of the Fourier series of Fourier integral. *SP-7 1968*

fovea
The central part of the retina, which contains a high concentration of the color sensitive receptors known as cones. *SP-7 1968*

fractals
Highly irregular geometrical figures such as snowflakes or the boundary of a cloud whose capacity dimension is not an integer. The capacity dimension characterizes the measuring of the number of different size superimposed squares needed to cover the geometric shape. By the use of differing size boxes, one is able to determine the capacity dimension. *1984*

fracture resistance
Use fracture strength

fracture strength
The normal stress at the beginning of fracture. Fracture strength is calculated from the load at the beginning of fracture during a tension test and the original cross-sectional area of the specimen. Used for fracture resistance and fracture toughness.
ASTM (E 6, E-28) 1968

fracture toughness
Use fracture strength

Fraunhofer lines
Dark lines in the absorption spectrum of solar radiation due to absorption by gases in the outer portions of the sun and in the earth's atmosphere. *SP-7 1968*

free atmosphere
That portion of the earth's atmosphere, above the planetary boundary layer, in which the effect of the earth's surface friction on the air is negligible, and in which the air is usually treated (dynamically) as a ideal fluid. The base of the free atmosphere is usually taken as the geostrophic wind level. *SP-7 1968*

free electron lasers
Multifrequency lasers utilizing optical radiation amplification by a beam of free electrons passing through a vacuum in a transverse periodic magnetic field, as opposed to conventional lasers in which the oscillating electrons are bound to atoms and molecules and have a specific wavelength. *1979*

free electrons
Electrons which are not bound to an atom. *SP-7 1968*

free fall
The fall or drop of a body, such as a rocket, not guided, not under thrust, and not retarded by a parachute or a braking device. The free and unhampered motion of a body along a Keplerian trajectory, in the force of gravity is counterbalanced by the force of inertia. *SP-7 1968*

free flight
Unconstrained or unassisted flight, as in the flight of a rocket after consumption of its propellant or after motor shutoff, in the flight of an unguided projectile, and in the flight in certain kinds of wind tunnels of unmounted models. *SP-7 1968*

free jets
Fluid jets without solid boundaries, such as a jet discharging into the open. *SP-7 1968*

free oscillations
Use free vibration

free radicals
Atoms or groups of atoms broken away from stable compounds by application of external energy, and, although containing unpaired electrons, remaining free for transitory or longer periods.
SP-7 1968

free vibration
Oscillation of a system in the abscence of external forces. Used for free oscillations. *SP-7 1968*

free-piston engines
Engines in which the pistons are not connected to the crank.
1987

frequencies
Of a function periodic in time, the recipricals of primitive periods. The unit is the cycle per unit time and must be specified. Used for frequency bands. *SP-7 1968*

frequency assignment
The specific frequency of frequencies authorized by competent authority; expressed for each channel by: (a) the authorized carrier frequency, the frequency tolerance, and the authorized emission bandwidth, (b) the authorized emission bandwidth in reference to a specific assigned frequency (when a carrier does exist), or (c) the authorized frequency band (when a carrier does not exist).
SP-7 1968

frequency bands
Use frequencies

frequency discriminators
Electronic circuits which deliver output voltages proportional to the deviations of signals from predetermined frequency values.
1977

frequency division multiple access
Multiple access communication system in which the user has a specific frequency allocation and uses all of the time axis while sharing the available power. Used for FDMA. *1979*

frequency hopping
Random changing of frequencies in transmission to mislead or prevent interception by unauthorized equipment. *1980*

frequency modulation
Angle modulation of a sine wave carrier in which the instantaneous frequency of the modulated wave differs from the carrier frequency by an amount proportional to the instantaneous value of the modulating wave. *SP-7 1968*

frequency response
The portion of the frequency spectrum which can be sensed by a device within specified limits of amplitude error. Response of a system as a function of the frequency of excitation. Used for phase response. *SP-7 1968*

frequency reuse
A digital satellite communication technique which features the reuse of frequency bands in a downlink transmission to provide high power utilization and flexible accommodation of dynamic source destination traffic patterns. *1981*

frequency shift keying
That form of frequency modulation in which the modulating wave shifts the output frequency between predetermined values, and the output wave is coherent with no phase discontinuity.
SP-7 1968

fresh water
Water in rivers, lakes, springs, etc. containing no significant amounts of dissolved salts. *1980*

Fresnel lenses
Thin lenses constructed with stepped setbacks so as to have the the optical properties of much thicker lenses. *DOE 1977*

Fresnel reflectors
Devices characterized by a set of mirrors with varying orientation arranged so as to have the optical properties of a smooth reflector e.g., parabolic reflector. *DOE 1968*

Fresnel region
The region between the antenna and the Fraunhofer region.
SP-7 1968

friction
The resistance to the relative motion of one body sliding, rolling, or flowing over another body with which it is in contact.
ASTM (D 3108, D 3412; D-13)1968

fringe multiplication
The duplicating effect of a family of curves superimposed on another family of curves so that the curves intersect at angles less than 45 degrees. A new family of curves appears which pass through intersections of the original curves. *1980*

frit
A powdered ceramic prepared by fusing a physical mixture of oxides into a uniform melt, which is then quenched and milled into a fine, homogeneous powder. *SP-7 1968*

Froude number
The nondimensional ratio of the inertial force to the force of gravity for a given fluid flow; the reciprocal of the Reech number.
SP-7 1968

frozen soils
Use permafrost

fuel cell power plants
Power generating devices that directly produce electrical energy from chemical energy and consist of fuel processors, stacked fuel cells, and dc to ac converters. The main types, distinguished by electrolytes which are heated to different temperatures, are base, phosphoric acid, molten carbonate, and solid oxide. *1982*

fuel cells
Devices which convert chemical energy directly into electrical energy but differing from a storage battery in that the reacting chemicals are supplied continuously as needed to meet output requirements. *SP-7 1968*

fuel consumption
The using of fuel by an engine or power plant; the rate of this consumption, measured, e.g., in gallons or pounds per minute.
SP-7 1968

fuel production
Producing of conventional and/or alternative fuels by various technologies. *1980*

functional design specifications
Those levels of design in which all subtasks are specified and their relationships defined so that the total collection of subsystems will perform the intended task of the entire system. *1980*

furans
Organic heterocyclic compounds containing diunsaturated rings of four carbon atoms and one oxygen atom; also known as furfuran or tetrol. *1978*

fusiform shapes
Use cones

fusion
The combining of atoms and consequent release of energy. *SP-7 1969*

fuzzy sets
Mathematical models coupled with a provision for the effect of human factors and construction process and experience. *1981*

fuzzy systems
Systems that involve fuzzy sets. *1981*

G

G force
Use acceleration (physics)

gadolinium alloys
Mixtures of gadolinium, a rare earth metal, with other metals. *1980*

galactic cosmic rays
Energetic particles that come from outside the solar systems. They generally come from within our galaxy. *1983*

galactic mass
The total amount of matter contained in a galaxy. *1987*

galactic radio waves
Radio waves emanating from our galaxy. *SP-7 1968*

galaxies
Vast assemblages of stars or nebulae, composing island universes *separated from other* such assemblages by great distances. *SP-7 1968*

Galilean satellites
The four largest and brightest satellites of Jupiter (Io, Europa, Ganymede, and Callisto). *1976*

Galileo mission
Use Galileo project

Galileo probe
The NASA Jupiter atmospheric entry probe to be deployed from the Galileo spacecraft. The probe will make in situ measurements while descending from a parachute. *1979*

Galileo project
A NASA program to probe Jupiter, its environment and natural satellites. The expected date of launch on the space shuttle is 1989. Used for Galileo mission. *1978*

Galileo spacecraft
A NASA orbiter spacecraft which will carry the Galileo probe and, following deployment at Jupiter, will become an orbiting platform for remote sensing of Jupiter and its satellites. *1979*

galvanic cells
Use electrolytic cells

game theory
Application of mathematics to a game, business situation, or other problem to maximize gain or minimize loss. *DOE 1968*

gamma radiation
Use gamma rays

gamma ray astronomy
Astronomy based on the detection of gamma-ray emission and interactions from supernova remnants, neutron stars, flare stars, galactic core and disc, black holes, etc. *1977*

gamma ray bursts
Short (about 0.1 - 4 sec.) intense low-energy (about 0.1 - 1.2 MeV) bursts recorded by the Vela satellite system in 1967. Their isotropic distribution suggests an extragalactic origin, but a galactic disk origin cannot be ruled out. Used for cosmic gamma ray bursts. *1981*

gamma ray lasers
Stimulated emission devices producing coherent gamma radiation. *1980*

gamma ray observatory
A late 1980's NASA mission to explore the gamma ray window to the universe from 0.06 MeV to 30 GeV. *1980*

gamma ray spectra
The energy distribution of gamma rays emitted by nuclei. *1978*

gamma ray spectrometers
Instruments for deriving the physical constants of materials by using induced gamma radiation as the emission source. *1980*

gamma ray telescopes
Special telescopes for the observation (and recording) of astronomical phenomena in the gamma ray spectrum. *1977*

gamma rays
Quantums of electromagnetic radiation emitted by nuclei, each such photon being emitted as the result of a quantum transition between two energy levels of the nucleus. Gamma rays have energies usually between 10 thousand electron volts and 10 million electron volts with correspondingly short wavelengths and high frequencies. Used for gamma radiation. *SP-7 1968*

gantries
Use gantry cranes

gantry cranes
Large cranes mounted on platforms that usually run back and forth on parellel tracks astride the work area. Used for gantries. *SP-7 1968*

Ganymede
A satellite of Jupiter orbiting at a mean distance of 1,071,000 kilometers. Also called Jupiter III. *SP-7 1976*

garnets
Groups of minerals that are silicates of cubic crystaline form. *1975*

gas atomization
Atomization of fluids by high velocity gas jets. *1980*

gas generator engines
Use engines
gas generators

gas generators
A device used to generate gases in the laboratory; a chemical plant for producing gas from coal, for example, water gas. Used for gas generator engines. *DOE 1968*

gas giant planets
The giant planets, Jupiter, Saturn, Uranus, and Neptune, of our solar system. *1977*

gas path analysis
Mathematical process of determining overall engine performance, individual module performances and sensor performances from any specific set of engine related measurements. *1982*

gas turbines
Turbines rotated by expanding gases, as in a turbojet engine or in a turbosupercharger. *SP-7 1968*

gas-solid interactions
Effects of the impingement of gases (particles) on solid surfaces in various environments. *1979*

gaseous cavitation
Use cavitation flow

gaskets
Preformed deformable devices designed to be placed between two adjoining parts to prevent the passage of liquid or gas between the parts. *ASTM (C 542, C-24; C 716, C-24) 1968*

gasohol (fuel)
Synthetic fuel consisting of a mixture of gasoline and grain alcohol (ethanol). *1979*

gauge theory
A field theory in which symmetrics of the theory are implemented locally in space and time. This leads to theories where forces are generally carried by vector bosons. Some gauge theories are electrodynamics, quantum chromodynamics, and Yang Mills theory. *1981*

Gaussian elimination
A technique for solving linear equations by progressive differencing. *1987*

Gaussian noise
Use random noise

Gaussmeters
Use magnetometers

GDOP
Use geometric dilution of precision

gegenschein
A round or elongated spot of light in the sky at a pont 180 degrees from the sun. Also called counterglow. *SP-7 1968*

Geiger counters
Instruments for detecting and measuring radioactivity. In full, Geiger-Mueller counter. Used for Geiger-Mueller tubes. *SP-7 1968*

Geiger-Mueller tubes
Use Geiger counters

gels
Liquids containing colloidal structural networks that form continuous matrices and completely pervade the liquid phase. Gels deform elastically upon application of shear forces less than the yield stress. At shear forces above the yield stress, the flow properties are principally determined by the gel matrices.
ASTM (D 2507, F-7) 1968

genetic engineering
The intentional production of new genes and alteration of genomes by the substitution or addition of new genetic material. Used for hybrids (biology). *1981*

geoastrophysics
Use astrophysics
geophysics

geodesy
The science which deals mathematically with the size and shape of the earth, and the earth's external gravity field, and with surveys of such precision that overall size and shape of the earth must be taken into consideration. Used for earth figure, earth shape, and Izsak ellipsoid. *SP-7 1968*

geodetic accuracy
The degree to which point positions or boundaries indicated on maps or imagery correspond with true geodetic positions. *1982*

geodetic coordinates
Quantities which define the position of a point on the spheroid of reference with respect to the planes of the geodetic equator and of a reference meridian. *SP-7 1968*

geodetic surveys
Surveys which takes into account the size and shape of the earth. *SP-7 1968*

Geodynamic Experimental Ocean Satellite
Use GEOS-D satellite

geodynamics
Study of the dynamic forces or processes within the earth. Used for crustal dynamics. *1978*

geofabrics
Use geotechnical fabrics

geofractures
Use geological faults

geographic information systems
Computer assisted systems that acquire, store, manipulate, and display geographic data. Some systems are not automated. *1982*

geoids
The figure of the earth as defined by the geopotential surface which most nearly coincides with mean sea level over the entire surface of the earth. *SP-7 1968*

geological faults
A surface or zone of rock fracture along which there has been displacement, from a few centimeters to a few kilometers in scale. Used for closed faults, cross faults, echelon faults, geofractures, grabens, rifts, splits (geology), step faults, and thrust faults. *DOE 1968*

geomagnetic crotchets
Use sudden ionospheric disturbances

geomagnetic equator
Use magnetic equator

geomagnetic field
Use geomagnetism

geomagnetic latitude
Angular distances from the geomagnetic equator, measured northward of southward through 90 degrees and labeled N or S to indicate the direction of measurement. *SP-7 1968*

geomagnetic storms
Use magnetic storms

geomagnetically trapped particles
Use radiation belts

geomagnetism
The magnetic phenomena, collectively considered, exhibited by the earth and its atmosphere and by extension the magnetic phenomena in interplanetary space. The study of the magnetic field of the earth. Used for geomagnetic field and terrestrial magnetism. *SP-7 1968*

geometric accuracy
The internal geometric fidelity of an imaging system. *1982*

geometric dilution of precision
A navigation and positioning system performance index expressing the dilution of range measurement precision due to the geometric relationship between user and satellites. It is formulated as the square root of the sum of the variances of position estimates in the three orthogonal directions and can be employed to determine the optimal locations for network satellites and in the selection of optimal satellite signals sources. Used for GDOP. *1980*

geometric rectification (imagery)
The correction of image distortions due to sensor view angle, platform attitude, or target surface features. *1980*

geometrical acoustics
The study of the behavior of sound under the assumption that sound transversing a homogeneous medium travels along straight line or rays. Used for ray acoustics. *1981*

geometrical hydromagnetics
Use magnetohydrodynamics

geometrical optics
The geometry of paths of light rays and their imagery through optiical systems. Used for ray optics. *1979*

geometrical theory of diffraction
A ray theory of diffraction process. *1981*

geometrodynamics
Use relativity

geomorphology
A science that deals with the land and submarine relief features of the earth's surface and genetic interpretation of them through using the principles of physiography in its descriptive aspects and of dynamic and structural geology in its explanatory phases. Used for physiography. *DOE 1968*

geophysical fluid flow cells
Apparatus used in model experiments for deep solar convection and Jovian atmospheric circulation for Spacelab 1 and Spacelab 3. *1980*

geophysical fluids
General term for the liquids and gases on or in the earth (from water in all forms, to petroleum and hydrocarbons in liquid and gaseous form, and molten rock material within the earth). *1980*

geophysics
The physics of the earth and it environment, i.e., earth, air, and (by extension) space. Classically, geophysics is concerned with the nature of and physical occurrences at and below the surface of the earth including, therefore, geology, oceanography, geodesy, seismology, and hydrology. The trend is to extend the scope of geophysics to include meteorology, geomagnetism, astrophysics, and other sciences concerned with the physical nature of the universe. Used for geoastrophysics. *SP-7 1968*

geopotential
The potential energy of a unit mass relative to sea level, numerically equal to the work that would be done in lifting the unit mass from sea level to to the height at which the mass is located; commonly expressed in terms of dynamic height or geopotential potential. *SP-7 1968*

geopotential height
The height of a given point in the atmosphere in units proportional to the potential energy of unit mass (geopotential) at this height, relative to sea level. *SP-7 1968*

geopotential research mission
A NASA gravity field mapping mission utilizing the low-low satellite tracking concept to measure the Doppler shift between two coorbiting polar satellites. Used for Gravsat satellites. *1980*

geopressure
Pressures that exceed the normal hydrostatic pressure of about 0.465 psi per foot of depth. *1981*

GEOS-D satellite
Another in a series of the European Space Agency's geostationary scientific satellites launched by NASA for long-term cosmic radiation studies. Used for Geodynamic Experimental Ocean Satellite. *1977*

Geosari project
Launch of GEOS on second development flight of Ariane launcher into a geostationary elliptical orbit in 1979. The name is derived from a combination of GEOS and ARIane. *1977*

Geostationary Operational Environ Sats
Use Goes satellites

Geostationary Operatl Environ Satellite B
Use Goes 2

geostationary platforms
Use synchronous platforms

geostationary satellites
Use synchronous satellites

geostrophic wind
The horizontal wind velocity for which the coriolis acceleration exactly balances the horizontal pressure force. *SP-7 1968*

geotechnical engineering
The science and practice of that part of civil engineering involving the inter-relationship between a geologic environment and the works of man. *1981*

geotechnical fabrics
Generic term for a variety of artificial fiber products used in engineering construction of civil works such as embankments. Also called geofabrics, filter cloth, geotextiles and civil engineering fabrics. Used for geofabrics and geotextiles. *1981*

geotemperature
Internal temperature of the planet earth. Used for geothermometry. *1981*

geotextiles
Use geotechnical fabrics

geothermal energy extraction
The removal for storage and/or utilization of heat from natural sources within the earth (hot springs, geysers, hot rocks, etc.) *1980*

geothermal energy utilization
Any application of energy derived from sources within the earth. *1980*

geothermal technology
The gamut of operations involved in the exploration, exploitation, and conversion of energy derived from geothermal sources. *1980*

geothermometry
Use geotemperature

German infrared laboratory
A proposed infrared telescope for Spacelab that was discontinued in 1985. It superseded the LIRTS (telescope). *1986*

germicides
Use bactericides

germinators
Use phytotrons

get away specials (STS)
Low-cost, man-independent Space Shuttle experimental payloads. *1987*

getters
Materials which are included in a vacuum system or device for removing gas by sorption. *SP-7 1968*

geysers
Hot springs that intermittently erupt jets of hot water and steam. *DOE 1968*

gimbals
Devices with two mutually perpendicular and intersecting axes of rotation, thus giving free angular movement in two directions, on which engines or other objects may be mounted. In gyros, supports which provide the spin axes with degrees of freedom. *SP-7 1968*

Giotto mission
The European Space Agency's mission to fly through the head of Halley's Comet in order to make in site measurements of the composition and physical state as well as the structures of the head. Included in the onboard equipment are cameras to determine the structures, spectrometers to determine the composition,and a plasma detector and a magnetometer to measure the interactions with the solar wind. The time of encounter with the comet was during the second week of March 1986. *1982*

glass lasers
High power lasers used in laser fusion technology research. *1980*

glassy carbon
Form of carbon with unique properties and characteristics. Formed by carbonizing phenolic resins made by reacting phenols with cellulosics, aldehydes, and ketones. *1980*

Glauert coefficient
Use aerodynamic forces
Mach number

glide angles
Use glide paths

glide paths
Flight paths of aeronautical vehicles in a glide, seen from the side. The paths used by aircraft or spacecraft in approach procedure and which are generated by instrument landing facilities. Used for glide angles and glide slopes. *SP-7 1968*

glide slopes
Use glide paths

Glimm method
Numerical technique for solving gas dynamics problems involving hyperbolic systems of conservation laws. *1981*

global positioning system
A satellite navigation system which will display many (up to 24) satellites in three sets of orbits by means of a precise time standard and three-dimensional information on position and velocity. *1977*

glow
Use luminescence

glow discharges
Electrical discharges that produce luminosity. *SP-7 1968*

gluons
The carriers of the strong force which holds atomic nuclei together (holding together groups of quarks making up stable particles, which in turn are bound together in the atomic nuclei). *1979*

gnomonic projection
A projection on a plane tangent to the surface of a sphere having the point of projection at the center of the sphere. Used in cartography and in crystallography. *1981*

gnotobiotics
The study of germ free animals. *SP-7 1968*

GNP
Use gross national product

Goes satellites
Geostationary operational environmental satellites. Used for Geostationary Operational Environ Sats. *1978*

Goes 1
The first in a series of geostationary operational environmental satellites launched in October 1975. It ceased operation in June of 1977. *1980*

Goes 2
The second in a series of geostationary operational environmental satellites launched in June 1977. Used for Geostationary Operatl Environ Satellite B. *1980*

Goes 3
The third in a series of geostationary operational environmental satellites launched in June 1978. *1980*

Goes 4
The fourth in a series of geostationary operational environmental satellites launched in September 1980. *1981*

Goes 5
The fifth in a series of geostationary operational environmental satellites launched in May 1981. *1981*

Goes 6
The sixth in a series of geostationary operational environmental satellites launched in April 1983. *1986*

Goes-G
Satellite which was to have been the seventh in a series of geostationary operational environmental satellites. The May 1986 launch failed. *1986*

goniometers
Instruments for measuring angles. *SP-7 1968*

goodness of fit
The degree to which the observed frequencies of occurrence of events in an experiment correspond to the probabilities in a model of the experiment. *1981*

grabens
Use geological faults

gradient index optics
Optical systems with components whose refractive indexes vary continuously within the material used for the optical elements. *1980*

grand unified theory
A theory describing the unification of gravity with the other elementary forces in physics, i.e. the weak force, the strong force and the electromagnetic force. Used for GUT. *1986*

grants
Assets bestowed or transferred, such as money or land, for a particular purpose. *DOE 1968*

graph theory
The mathematical study of the structure of graphs and networks. *1976*

graphite-epoxy composites
Structural materials composed of epoxy resins reinforced with graphite. *1977*

graphite-polyimide composites
Composite materials utilizing graphite reinforcing fibers in a resin matrix. *1980*

graphoepitaxy
The use of artificial surface relief structures to induce crystallographic orientation in thin films. *1980*

Grashof number
A nondimensional parameter used in the theory of heat transfer. The Grashof number is associated with the Reynolds number and the Prandtl number in the study of convection. *SP-7 1968*

gravel deposits
Use gravels

gravels
Coarse, granular aggregates, with pieces larger than sand grains, resulting from the natural erosion of rock. Used for gravel deposits. *ASTM (D 1079, D-8) 1968*

gravireceptors
Highly specialized nerve endings and receptor organs located in skeletal muscles, tendons, joints, and in the inner ear which furnish information to the brain with respect to body position, equilibrium. and the direction of gravitational forces. *SP-7 1968*

gravitation
The acceleration produced by the mutual attraction of two masses, and of magnitude inversely proportional to the square of the distance between the two centers of mass. Used for gravity. *SP-7 1968*

gravitational constant
The coefficient of proportionality in Newton's law of gravitation. *SP-7 1968*

gravitational wave antennas
Devices for receiving propagating gravitational fields produced by some change in the distribution of matter. *1978*

gravitons
The hypothetical elementary units of gravitation which are equivalent in the electrons in electromagnetic theory. *SP-7 1970*

gravity
Use gravitation

gravity probe B
An experiment designed to measure general relativistic induced torques on a gyroscope in orbit about the earth. *1982*

gravity waves
Waves in an interface between fluids of different density in which the restoring force is gravity. *DOE 1968*

Gravsat satellites
Use geopotential research mission

gray scale
Images that are not colored or multispectral. *1984*

grazing incidence
Incidence at a small glancing angle. *1977*

grazing incidence solar telescope
Use GRIST (telescope)

great circles
Circles which intersect a sphere and a plane through its center. *SP-7 1968*

greenhouse effect
The heating effect exerted by the atmosphere upon the earth by virtue of the fact that the atmosphere (mainly, its water vapor) absorbs and reemits infrared radiation. *SP-7 1968*

greenhouses
Structures enclosed by glass or plastic devoted to the cultivation or protection of tender plants or the production of plants out of season. *1981*

GRIST (telescope)
An ESA Spacelab payload designed for grazing incidence solar phenomena that is still in the study phase. Used for grazing incidence solar telescope. *1977*

gross national product
The total value of the goods and services produced in a nation during a specific period and also comprising the total expenditures by consumers and government plus gross private investment. Used for GNP. *1978*

ground clouds
Use exhaust clouds

ground effect (aerodynamics)
Increase in the lift of an aircraft operating close to the ground caused by reaction between high-velocity downwash from its wing or rotor and the ground. *1976*

ground effect (communications)
The effect of ground conditions on radio communications. *1976*

ground support equipment
That equipment on the ground, including all implements, tools, and devices (mobile or fixed), required to inspect, test, adjust, calibrate, appraise, gage, measure, repair, overhaul, assemble, transport, safeguard, record, store, or otherwise function in support of a rocket, space vehicle, or the like, either in the research and development phase or in operational phase, or in support of the guidance system used with the missile, vehicle, or the like. *SP-7 1968*

ground truth
Data obtained on the ground concerning the significance of anomalies observed in remote sensing to help interpretation. *SP-7 1968*

group velocity
The velocity of a wave disturbance as a whole, i.e., of an entire group of component simple harmonic waves. *SP-7 1968*

growth chambers
Use phytotrons

guanosines
Guanine riboside; a nucleoside composed of guanine and ribose. Used for vernine. *1981*

guayule
A desert shrub native to southwestern United States and north Mexico that produces polymeric isoprene essentially identical to that made by Hevea rubber trees in southeast Asia. *1981*

guidance (motion)
The process of directing the movements of an aeronautical vehicle or space vehicle, with particular reference to the selection of a flight path. *SP-7 1968*

guide vanes
Control surfaces that may be moved into or against a rocket's jetstream, used to change the direction of the jet flow for thrust vector control. Used for jetavators. *SP-7 1968*

gun launchers
Ordnance devices for firing missiles and rockets with initial attitude control. *1968*

GUT
Use grand unified theory

gypsum
The mineral consisting primarily of fully hydrated calcium sulfate (calcium sulfate dihydrate). *ASTM (C 11, C-11) 1968*

gyro horizons
Artificial horizons or attitude gyroscopes. *SP-7 1968*

gyrodampers
Single-gimbal control moment gyros actively controlled to extract the structural vibratory energy through the local rotational deformations of a structure; used in large space structures. *1980*

gyrofrequency
The natural period of revolution of a free electron in the earth's magnetic field. *SP-7 1968*

gyros
Use gyroscopes

gyroscopes
Devices which utilize the angular momentum of a spinning mass (rotor) to sense angular motion of its base about one or two axes orthogonal to the spin axis. Used for gyros, gyroscopic drift, and gyrostats. *SP-7 1968*

gyroscopic drift
Use gyroscopes

gyrostats
Use gyroscopes

gyrotrons
Use cyclotron resonance devices

H

H-60 Helicopter
The Black Hawk (Sikorsky) assault helicopter. Used for Black Hawk assault helicopter. *1980*

habitats
The areas or types of environment in which plants or animals normally occur or live. *DOE 1972*

HAL/S (language)
Programming language developed for the flight software of the NASA Space Shuttle program. *1977*

half life
The average time required for one half the atoms in a sample of radioactive element to decay. *SP-7 1968*

Hall coefficient
Use Hall effect

Hall currents
Use Hall effect

Hall effect
The electrical polarization of a horizontal conducting sheet of limited extent, when that sheet moves laterally through a magnetic field having a component vertical to the sheet. The Hall effect is important in determining the behavior of the electrical currents generated by winds in the lower atmosphere. Used for Hall coefficient and Hall currents. *SP-7 1968*

Halley's comet
A member of the solar system with an orbit and a period of about 76 years. It appeared in 1985-1986. *1977*

halocarbons
Compounds consisting of halogen atoms and carbon atoms. *1978*

HALOE
Use halogen occultation experiment

halogen occultation experiment
Shuttle experiment to provide global stratospheric vertical concentration profiles of key chemical species involved in the catalytic destruction of ozone due to chlorine compounds. Used for HALOE. *1981*

handling qualities
Use controllability

hang gliders
Ultralight, unpowered aircraft in which the pilot controls the flight attitide and glide path by shifting his position on a suspended seat (swing seat). *1977*

hard landing
An impact landing of a spacecraft on the surface of a planet or natural satellite destroying all equipment except possibly a very rugged package. *SP-7 1972*

hardening (systems)
Techniques for decreasing the susceptibility or vulnerability of weapon systems and components. *1968*

hardness
Resistance of metal to plastic deformation usually by indentation. However the term may also refer to stiffness or temper, or to resistance to scratching, abrasion, or cutting. *SP-7 1968*

hardware
Physical equipment as contrasted to ideas or design that may exist only on paper. *SP-7 1968*

harmonic analysis
A statistical method for determining the amplitude and period of certain harmonic or wave components in a set of data with the aid of Fourier series. *SP-7 1968*

harmonic functions
Any solution of the Laplace equations. *SP-7 1968*

harmonic motion
The projection on a diameter of the circle of such motion. *SP-7 1968*

harmonics
Eigenfrequency oscillations excited in a vibrating system. Used for overtones. *DOE 1968*

Hartree-Fock-Slater method
A refined approximation method for the calculation from wave function of electron total energies, kinetic energies, etc. for chemical elements. *1977*

Hawkeye 1 satellite
Use Explorer 52 satellite

HAZ (metallurgy)
Use heat affected zone

hazardous material disposal (in space)
The disposal in space of hazardous material. When radioactive materials are involved the expected lifetime of orbit exceeds the lifetime of the radioactivity. *1983*

HCL argon lasers
Gas lasers in which the active material is gaseous hydrogen chloride and argon. *1976*

HCL lasers
Gas lasers in which the active material is gaseous hydrogen chloride. Used for hydrogen chloride lasers. *1976*

headsets
Use earphones

HEAO A
Use HEAO 1

HEAO B
Use HEAO 2

HEAO C
Use HEAO 3

HEAO 1
The first of three NASA high energy astronomy observatories launched during 1977 for the study of cosmic rays and earth's magnetic field to study the x ray and gamma ray sky. Used for HEAO A, High Energy Astronomy Observatory A, and High Energy Astronomy Observatory 1. *1978*

HEAO 2
The second of three NASA high energy astronomy observatories. It was launched during 1978 for the study of specific x ray objects, quasars, x ray pulsars, and candidate black holes. Used for Einstein Observatory, HEAO B, High Energy Astronomy Observatory B, and High Energy Astronomy Observatory 2. *1978*

HEAO 3
The third of three NASA high energy astronomy observatories. It was launched during 1979 for the study of cosmic rays and elemental and isotropic composition as a corollary to a search of narrow gamma ray lines. Used for HEAO C, High Energy Astronomy Observatory C, and High Energy Astronomy Observatory 3. *1978*

heat
Energy transferred by a thermal process. *SP-7 1968*

heat affected zone
That portion of the base metal the structure or properties of which have been altered by the heat of welding or gas-cutting operation. Used for HAZ (metallurgy). *1986*

heat balance
The equillibrium which exists on the average between the radiation received by a planet and its atmosphere from the sun and that emitted by the planet and the atmosphere. The equillibrium which is known to exist when all sources of heat gain and loss for a given region of body are accounted for. In general this balance cludes advective or evaporative terms as well as a radiation term. *SP-7 1968*

heat capacity
Use specific heat

heat content
Use enthalpy

heat equations
Use thermodynamics

heat exchangers
Devices for transferring heat from one fluid to another without intermixing the fluids, as a regenerator and, an apparatus for cooling of heating the air in a wind tunnel. *SP-7 1968*

heat flow
Use heat transmission

heat flux
The thermal intensity indicated by the amount of energy transmitted per unit area. *ASTM (D 123, D 4391, D-13) 1968*

heat of fusion
The increase in enthalpy accompanying the conversion of one mole, or a unit mass, of a solid to a liquid at its melting point at constant pressure and temperature. Used for latent heat of fusion. *1980*

heat resistance
Use thermal resistance

heat resistant alloys
Alloys developed for very high temperature service where relatively high stresses (tensile, thermal, vibratory, and shock) are encountered and where oxidation resistance is frequently required. Used for high temperature alloys and superalloys. *SP-7 1968*

heat shielding
The use of devices that protect something from heat. Specifically, the protective structure necessary to protect a reentry body from aerodynamic heating. Used for thermal shielding. *SP-7 1968*

heat transfer
The transfer or exchange of heat by radiation, conduction, or convection with a substance and between the substance and its surroundings. Used for nonadiabatic processes. *SP-7 1968*

heat transfer coefficients
The rate of heat transfer per unit area per unit temperature difference, a quantity having the dimensions of reciprocal length. *SP-7 1968*

heat transmission
Heat transmitted from one substance to another. Used for heat flow. *DOE 1968*

heat treatment
Heating and cooling a solid metal or alloy in such a way as to obtain desired conditions or properties. *SP-7 1968*

heavy lift airships
Airships designed to lift heavy materials. *1981*

heavy water
Water in which the hydrogen of the water molecule consists entirely of the heavy hydrogen isotope of mass 2 (deuterium). Used for deuterium oxides and hydrogen deuterium oxide. *SP-7 1968*

height
Vertical distance; the distance above some reference point or plane, as, height above sea level. The vertical dimension of anything; the distance which something extends above its foot or root, as blade height. *SP-7 1968*

helical antennas
Antennas used where circular polarization is required. The driven element consists of a helix suported above a ground plane. *SP-7 1968*

helicopter impulsive noise
Use blade slap noise

heliographs
Use spectroheliographs

heliography
Use spectroheliographs

heliometry
Use pyroheliometers

heliosphere
The region around the sun whose plasma processes are dominated by solar wind. *1981*

heliostats
Instruments consisting of mirrors moved by clockwork for reflecting the sun's rays in a fixed direction. *1977*

helix tubes
Use traveling wave tubes

Helmholtz resonators
An enclosure having a small opening consisting of a straight tube of such dimensions that the enclosure resonates at a single frequency determined by the geometry of the resonator. *1981*

hematite
A common iron mineral; ferric oxide. *DOE 1968*

hemoperfusion
Type of poison treatment in which the patient's blood is passed over a bed of absorbent material (activated carbon, resin, etc.) to remove the toxin from the bloodstream. *1980*

hepatitis
An inflammation of the liver, commonly of viral origin, but also associated with other diseases. *1978*

herbicides
Chemical agents used for the eradication of undesirable plants or for the inhibition of their growth. *1979*

Herbig-Haro objects
Celestial objects having many of the characteristics of a T Tauri star (e.g., their spectra show a weak continum with strong emission lines), believed to be stars in the very early stages of development. All known Herbig-Haro objects have been found within the boundaries of dark clouds. These strong infrared sourcesare characterized by mass loss. *1978*

Hessian matrices
Given a real value function of N variables, an N by N symmetric of all second order partial derivatives. *1981*

heterodyning
Mixing two radio signals of different frequencies to produce a third signal which is of lower frequency; i.e., to produce beating. *SP-7 1968*

heterogeneity
Having different properties at different points. *ASTM (D 653, D-18) 1968*

heterojunction devices
Electronic devices utilizing junctions between different semiconducting materials. The characteristics and performance of the devices are dependent on the relative lineup of the energy bands at the junctions. *1978*

heterojunctions
Boundaries between two different semiconductor materials, usually with a negligible discontinuity in the crystal structure. *1980*

heterosphere
The upper portion of a two part division of the atmosphere according to the general homogeneity of atmospheric composition; the layer above the homosphere. The heterosphere is characterized by variation in composition and mean molecular weight of constituent gases. This region starts at 80 to 100 kilometers above the earth, and therefore closely coincides with the ionosphere and the thermosphere. *SP-7 1970*

high altitude flight
Use flight

high electron mobility transistors
A recently developed field effect transistor based on the technique of modulation doping of GaAs/Al(x)Ga(1-x) as heterojunctions. This technique achieves high mobility in part by introducing carriers into high purity GaAs from donor ions in an adjacent A1GaAs layer, the electrons and ions being separated by the built in heterojunction potential. *1985*

High Energy Astronomy Observatory A
Use HEAO 1

High Energy Astronomy Observatory B
Use HEAO 2

High Energy Astronomy Observatory C
Use HEAO 3

High Energy Astronomy Observatory 1
Use HEAO 1

High Energy Astronomy Observatory 2
Use HEAO 2

High Energy Astronomy Observatory 3
Use HEAO 3

high intensity lasers
Use high power lasers

high level languages
Computer languages whose instructions or statements each correspond to several machine language instructions. *1980*

high pass filters
Wave filters having a single transmission band extending from some critical or cutoff frequency, not zero, up to infinite frequency. *SP-7 1968*

high power lasers
Stimulated emission devices having high energy flux density outputs. Used for high intensity lasers. *1979*

high Reynolds number
A Reynolds number above the critical Reynolds number of a sphere. *1982*

high speed flight
Use flight

high temperature alloys
Use heat resistant alloys

high temperature superconductors
New superconducting materials consisting of mixed metal oxide ceramics that maintain their superconductivity at higher temperature ranges (above 24 K) than the more traditional superconductors. *1987*

hinge moments
Use torque

HIP (process)
Use hot isostatic pressing

Hipparcos satellite
A planned ESA astrometric satellite to determine trigonometric parallaxes, proper motions, and positions of 100,000 stars, mainly for stars brighter than magnitude 10. The satellite is scheduled for launch in 1988. *1982*

hiss
Random noise in the audiofrequency range, having subjective characteristics analogous to prolonged sibilant sounds. *SP-7 1968*

histochemical analysis
In biochemistry, the analysis of chemical components in tissues. *1977*

hohlraums
In radiation thermodynamics, cavities whose walls are in radiative equilibrium with the radiant energy with the cavity. *SP-7 1968*

Hohmann trajectories
Use transfer orbits

Hohmann transfer orbits
Use transfer orbits

hole burning
A laser process that depletes, spatially or spectrally, the electron/hole pair density in a region of space or frequency of high coherent light, being spatial hole burning and spectral hole burning respectively. *1983*

hole geometry (mechanics)
The sizes, locations, and shapes of perforations created in materials. *1980*

holographic subtraction
A holographic technique by which two dissimilar optical fields can be subtracted to yield only their difference. Used for self subtraction holography. *1981*

homing
The following of a path of energy waves to or toward their source or point of reflection. *SP-7 1968*

homogeneity
Having the same properties at all points.
ASTM (D 653, D-18) 1968

homojunctions
Solar cells where both sides of the cell are made of the same material. *1981*

homopolar generators
Rotating electric machines for converting mechanical power into pure direct current by utilizing poles having the same polarity at the armature. *1978*

homosphere
The lower portion of a two part division of the atmosphere according to the general homogeniety of atmospheric composition; opposed to the heterosphere. The region in which there is no gross change in atmospheric composition, that is, all the atmosphere from the earth's surface to about 90 kilometers. The homosphere is about equivalent to the neutrosphere, and includes the troposphere, stratosphere, and mesosphere; it also includes the ozonosphere and at least part of the chemosphere. *SP-7 1968*

honeycomb cores
Lightweight strengthening materials of structures resembling honeycomb meshes. *SP-7 1968*

horizon
That great circle of the celestial sphere midway between the zenith and nadir, or a line resembling of approximating such a circle.
SP-7 1968

horizontal branch stars
Horizontal strips of stars on the Hertzsprung-Russell diagram of globular clusters to the left of the red giant branch. *1981*

horizontal orientation
The attitude of an object in reference to the plane which is perpendicular to the direction of gravity. *1980*

horn antennas
Antennas shaped like a horn. *SP-7 1968*

hot atoms
Atoms with high internal or kinetic energy as a result of a nuclear process such as beta decay or neutron capture. *1977*

hot cathodes
Cathodes that function primarily by the process of thermionic emission. *SP-7 1968*

hot corrosion
The corrosion at high temperatures as a result of the reduction of protective oxide coatings and scales and the subsequent accelerated oxidation. *1979*

hot forming
Use hot working

hot isostatic pressing
A thermomechanical process for forming metal-powder compacts or ceramic shapes by use of isostatically applied gas pressure in order to achieve high density in the treated material. Used for HIP (process). *1986*

hot pressing
The simultaneous heating and molding of a compact.
ASTM (B 243, B-9) 1968

hot working
Controlled mechanical operations for shaping a product at temperatures above the recrystallization temperature. Used for hot forming. *ASTM (B 601, B-5) 1968*

HOTOL launch vehicle
A British unmanned horizontal takeoff and landing single-stage-to-orbit launch vehicle. Later launches will be manned. *1987*

HTPB propellants
Solid rocket propellants containing hydroxyl terminated polybutadiene as bonding material. *1979*

Hubble constant
The rate at which the velocity of recession of the galaxies increases with distance. *1978*

hum
Electrical disturbance at the power supply frequency or harmonics thereof. *SP-7 1968*

human engineering
Use human factors engineering

human factors engineering
Application of information on physical and psychological characteristics of man to the design of devices and systems for human use. Used for ergonomics and human engineering.
DOE 1968

human resources
Those elements of support and capability that are provided by persons using their mental and physical capabilitites.
ASTM (E 548, E-36; E699, E-6) 1968

human-computer interface
Use man-computer interface

humidity
The amount of water vapor in the air. Specifically, relative humidity. *SP-7 1968*

Huygens principle
A very general principle applying to all forms of wave motion which states that every point on the instantaneous position of an advancing phase front (wave front) may be regarded as a source of secondary spherical wavelets. The position of the phase front a moment later is then determined as the envelope of all the secondary wavelets (ad infinitum). *SP-7 1968*

hybrid structures
An assembly constructed of interconnected rigid and flexible structural shapes; designed to sustain dynamic, static, and other loads. *1978*

hybrids (biology)
Use genetic engineering

hydraulic actuators
Use actuators

hydroaeromechanics
Use aerodynamics

hydrobarophones
Use hydrophones

hydrocracking
Technique for the catalytic conversion of coal into liquid fuels. *1979*

hydrodynamic coefficients
The factors producing motions in floating objects in liquids. *1980*

hydrodynamic ram effect
The physical effect (force) transmitted to the walls of a liquid filled container by the action of a projectile penetrating the container and transferring its energy to the liquid as kinetic energy. The fluid, in turn, transfers this kinetic energy to the walls of the container, causing excessive structural damage. *1977*

hydroelectricity
Electric power produced by water power using water wheels, turbogenerators, or other conversion equipment. *1980*

hydrogen chloride lasers
Use HCL lasers

hydrogen deuterium oxide
Use heavy water

hydrogen embrittlement
A decrease in fracture strength of metals due to the incorporation of hydrogen in the metal lattice. *DOE 1972*

hydrogen engines
Internal combustion engines utilizing gaseous hydrogen as the fuel. *1977*

hydrogen masers
A stimulated emission device in which hydrogen gas provides an output signal with a high degree of stability and spectral purity. *1980*

hydrogen metabolism
The physical and chemical processes by which an organism transforms the complex hydrogen components of foodstuffs into simple hydrogen compounds by disassimilation and catabolism in the production of energy. *1979*

hydrogen oxygen engines
Engines using liquid hydrogen as fuel and liquid oxygen as oxidizer. Used for hydrox engines and lox-hydrogen engines. *SP-7 1968*

hydrogen production
Production of hydrogen for fuel purposes by photosynthetic, chemical, electrical, thermal, electrochemical, or other means. *1977*

hydrogen 2
Use deuterium

hydrology models
Mathematical or physical representations by which the circulation, distribution, and properties of the waters of the earth can be studied. *1978*

hydromagnetic waves
Use magnetohydrodynamic waves

hydromagnetics
Use magnetohydrodynamics

hydromagnetism
Use magnetohydrodynamics

hydrometers
Instruments used for measuring the specific gravity of a liquid. *SP-7 1968*

hydrophones
Microphones suitable for use in water of other liquid. Used for hydrobarophones. *SP-7 1968*

hydroponics
Growing of plants in a nutrient with the mechanical support of an inert medium such as sand. *DOE 1970*

hydropyrolysis
A coal-to-liquid process in which bituminous coal, lignite, tars, sand and related materials are rapidly heated to 1000-1100 degrees K in pressurized hydrogen gasification reactors to generate pure methane. *1980*

hydrosphere (earth)
Use earth hydrosphere

hydrostatic pressure
A state of stress in which all the principal stresses are equal (and there is no shear stress). *ASTM (D 653, D-18) 1968*

hydrothermal stress analysis
The evaluation of the combined effects of temperature-humidity cycling. *1981*

hydrothermal systems
Energy systems utilizing hot water from geysers, hot springs, solar heating, and other sources. *1980*

hydrox engines
Use hydrogen oxygen engines

hygral properties
The affinity of something for moisture. *1979*

hygrometers
Instuments for measuring the humidity of the atmosphere. *ASTM (D 123, D-13) 1968*

hyperbolas
Open curves with two branches, all points of which have a constant difference in distance from two fixed points called focuses. *SP-7 1968*

hyperbolic navigation
Radio navigation in which a hyperbolic line of position is established by signals received from two stations at a constant time difference. *SP-7 1968*

hypercube multiprocessors
Distributed-memory, message-passing multiprocessors designed to reduce the number of interconnections compared to the number of processors. Other simple geometries such as rings, meshes, or trees of processors can be embedded in hypercubes. *1987*

Hyperion
One of the natural satellite of Saturn orbiting at a mean distance of 1,481,000 kilometers. *SP-7 1974*

hyperkinesia
Excessive exercise, that is often accompanied by uncontrollable muscular movement. *1980*

hyperons
In the classification of subatomic particles according to mass, the heaviest of such particles. Some large and highly unstable components of cosmic rays are hyperons. *SP-7 1968*

hyperoxia
A condition in which the total oxygen content of the body is increased above that normally existing a sea level. Used for oxygen toxicity. *SP-7 1968*

hypersonic flow
In aerodynamics, flow of a fluid over a body at speeds much greater than the speed of sound and in which the shock waves start at a finite distance from the surface of the body. *SP-7 1968*

hypersonic gliders
Unpowered vehicles, specifically reentry vehicles, designed to flow at hypersonic speeds. *SP-7 1968*

hypersonics
That branch of aerodynamics that deals with hypersonic flow. *SP-7 1968*

hypervelocity
Extremely high velocity. Applied by physicists to speeds approaching the speed of light, but generally implies speeds of the order of satellite speed and greater. *SP-7 1969*

hyperventilation
Overbreathing. A resperatory minute volume, or pulmonary ventilation that is greater than normal. *SP-7 1968*

hypocapnia
Deficiency of carbon dioxide in the blood and body tissues, which may result in dizziness, confusion, and muscular cramps. *SP-7 1968*

hypoventilation
A respiratory minute volume, or pulminary ventilation that is less than normal. Also called underbreathing. *SP-7 1968*

hypoxemia
The condition of reduction of the normal oxygen tension in the blood. *SP-7 1968*

hypoxia
Oxygen want of deficiency; any state wherein a physiologically inadequate amount of oxygen is available to, or utilized by, tissue without respect to cause or degree. Used for oxygen deficiency. *SP-7 1968*

hysteresis
Any of several effects resembling a kind of internal friction, accompanied by the generation of heat within the substance affected. The delay of an indicator in registering a change in a parameter being measured. *SP-7 1968*

I

Iapetus
A satellite of Saturn orbiting at a mean distance of 3,562,000 kilometers. *SP-7 1969*

ICL computers
Family of British digital computers produced by International Computers, Ltd. Used for International Computers Limited. *1977*

ideal gas
A gas which conforms to Boyle's law and has zero heat of free expansion (or also obeys Charles' law). Used for perfect gas. *SP-7 1968*

igniters
Devices used to begin combustion, such as a spark plug in a combustion chamber of a jet engine, or a squib used to ignite the fuel in a rocket. *SP-7 1968*

ignition
The initiation of combustion. Used for reignition. *ASTM (D 123, D 4391; D-13) 1968*

IGY (geophysical year)
Use International Geophysical Year

illuminance
The total luminous flux received on a unit area of a given real or imaginary surface, expressed in such units as the footcandle, lux, or phot. Illuminance is analogous to irradience, but is to be distinguised from the latter in that illuminance refers only to light and contains the luminous efficiency weighting factor necessitated by the nonlinear wavelength response of the human eye. Used for light pressure. *SP-7 1968*

ilmenite
A mineral having the theoretical composition FeO.TiO2 used principally in the production of titanium oxide. *ASTM (C 242, C-21) 1968*

ILS (landing systems)
Use instrument landing systems

image analysis
Technique for understanding or quantification of digital data as presented in a two dimensional format. *1983*

image processing
Conversion of optical images into digital data form for storage and reconstruction by computer techniques. *1977*

image reconstruction
The reproduction of the original scene from data stored or transmitted after scanning by an electron beam. In reprography, the re-creation of graphic images from digital data stored in a computer. *1979*

image resolution
In optics, a measure of the ability of an optical instrument to produce separable images of different points on an object. *1977*

image rotation
Mechanized or digital rotation of an image. *1981*

immunoassay
An assay that utilizes antigen-antibody reactions for the determination of biochemical substances. Used for plasma renin activity. *1981*

impact acceleration
The acceleration generated by very sudden starts or stops of a vehicle. The term is usually applied in the context of physiological acceleration. Used for impact deceleration. *SP-7 1968*

impact deceleration
Use deceleration
impact acceleration

impact fusion
The conversion of the kinetic energy of a fast moving, initially stationary, macroparticle projectile into the internal energy of fusile material using a particle accelerator. Impact fusion is generally an inertial confinement fusion concept. *1981*

impact melts
Molten material resulting from hypervelocity impact. *1980*

impact strength
The amount of energy required to fracture a material. The type of specimen and the testing conditions affect the values and therefore should be specified. *SP-7 1968*

impedance
The total opposition that a circuit presents to the flow of an alternating current, specifically the complex quotient of voltage divided by current. Used for dummy loads.
ASTM (E 268, E-7) 1968

impellers
Devices that impart motion to a fluid; specifically in centrifugal compressors, rotary disks which, faced on one or both sides with radial vanes, accelerate the incoming fluid outward into diffusers.
SP-7 1968

impingement
A process resulting in a continuing succession of impacts between (liquid or solid) particles and a solid phase.
ASTM (G 76, G-2) 1968

implosions
The rapid inward collapsing of the walls of vacuum systems or devices as the result of failure of the walls to sustain the ambient pressure. *SP-7 1968*

impulses
The products of the forces and the times during which the forces are applied. *SP-7 1968*

IMS
Use International Magnetospheric Study

incandescence
Emission of light due to high temperature of the emitting material. Any other emission of light is called luminescence. *SP-7 1968*

incidence
Partial coincidence, as a circle and a tangent line. The impingement of a ray on a surface. *SP-7 1968*

inclination
The angle between the plane of an orbit and the reference plane. The equator is the reference plane for geocentric orbits and the eliptic is the reference plane for heliocentric orbits. Also the magnetic dip. *SP-7 1968*

incoherent scatter radar
Radar used in the study of the ionosphere, thermosphere, etc.
1977

independent variables
Any of those variables of a problem, choosen according to convenience, which may arbitrarily be specified, and which then determine the other or dependent variables of the problem. The independent variables are often called the coordinates, particularly in problems involving motion in space. Dependant and independant variables can be interchanged, e.g., height and pressure. Used for arguments (mathematics) and parameters. *SP-7 1968*

indium-tin-oxide semiconductors
Use ITO (semiconductors)

indoor air pollution
Pollution found in enclosed spaces often compounded by insufficient air mixing which intensifies the concentration of pollutants caused by outdoor and/or indoor sources. *1985*

inelastic collisions
Collisions between two particles in which changes occur both in the internal energy of one or both of the particles and in the sums, before and after collisions, of their kinetic energies.
SP-7 1968

inelastic stress
A force acting on a solid and producing a deformation such that the original shape and size of the solid are not restored after the force is removed. *1980*

inert atmosphere
A gaseous medium that because of its lack of chemical reaction is used to enclose tests or equipment. *SP-7 1968*

inert gases
Use rare gases

inertia
Resistance to acceleration. Used for inertial forces. *SP-7 1968*

inertia bonding
The joining of materials with friction and pressure. *1980*

inertial confinement fusion
The process of using intense beams of heavy ions to convey the energy needed to compress and heat small pellets containing deuterium-tritium fuels to achieve ignition of the pellets. *1980*

inertial forces
Use inertia

inertial fusion (reactor)
Reactors in which pellet fusion is initiated by high energy sources including lasers. *1977*

inertial guidance
Guidance by means of the measurement and integration of acceleration from within the craft. *SP-7 1968*

inertial navigation
Dead reckoning performed automatically by a device which gives a continuous indicationof position by integration of accelerations since leaving a starting point. *SP-7 1968*

infinity
A point, line, or region, beyond measurable limits. *SP-7 1968*

information
Any facts or data which can be used, transferred, or communicated. *SP-7 1968*

information adaptive system
The spaceborne portion of the NASA End-to-End Data System. *1981*

information processing (biology)
An approach to the study of perception, memory, language and/or thought that considers organisms to be complex systems that receive, transform, store and transmit information. *1987*

infrared absorption
The taking up of energy from infrared radiation by a medium through which the radiation is passing. *1977*

infrared astronomy satellite
A joint NASA-Netherlands-Great Britain spacecraft designed to perform astronomical observations in the infrared spectral region. It was launched on January 25, 1983. Used for IRAS. *1977*

infrared photometry
Photometry in the infrared region. *1985*

infrared radar
Radar covering a range from the limit of the visible spectrum to the shortest microwaves. *1981*

infrared radiation
Electromagnetic radiation lying in the wavelength interval from 75 microns to an indefinite upper boundary sometimes arbitrarily set at 1000 microns (0.01 centimeter). *SP-7 1968*

infrared signatures
The infrared spectral characteristics of an object or uniform land surface which uniquely defines it. *1983*

infrared sources (astronomy)
Celestial bodies or astronomical regions emitting a large amount of radiation in the infrared portion of the electromagnetic spectrum. *1986*

Infrared Space Observatory (ISO)
An astronomical satellite observatory funded by ESA operating at wavelengths from 3 to 200 microns. The obervatory is comprised of a 60 cm Cassegrain telescope, a CCD infrared camera, two Michelson interferometers, and a photopolarimeter. *1987*

infrared suppression
The shielding and/or protection of aircraft engines and exhausts from heat-seeking missiles and/or detecting devices. *1981*

infrared telescopes
Special optical instruments for astronomical observations in the range from one micron to one millimeter. *1977*

infrared windows
A frequency region in the infrared where there is good transmission of electromagnetic radiation through the atmosphere. *1976*

infrasonic frequencies
Frequencies below the audiofrequency range. *SP-7 1968*

ingots
Cast metals in forms intended for subsequent fabrication. *ASTM (E 7,E-4) 1968*

inhalation
Use respiration

inhibitors
Things that inhibit; specifically substances bonded, taped, or dip dried onto a solid propellant to restrict the burning surface and to give direction to the burning process. *SP-7 1968*

initial value problems
Use boundary value problems

injection molding
A forming process in which a heat softened or plasticized material is forced from a cylinder into a relatively cool cavity which gives the product a desired shape. A similar process is used for forming solid propellants from quick cure ingredients. *1979*

injectors
Devices that propel fuel or propellant into a combustion chamber under pressure other than atmospheric. *SP-7 1968*

inlet airframe configurations
Optimum locations of engine inlets for various purposes. *1981*

inlet pressure
In connection with performance data on pumps, when not otherwise specified, the total static pressure measured in a standard testing chamber by a vacuum gage located near the inlet port. *SP-7 1968*

inlet temperature
A location for measuring the temperature of fluids, particles, etc. entering a heat system, an engine, or other machine. *1980*

insensitivity
Use sensitivity

insolation
In general, solar radiation received at the earth's surface. The rate at which direct solar radiation is incident upon a unit horizontal surface at any point on or above the surface of earth. (Contracted from INcoming SOLar radiATION). *SP-7 1968*

inspection
The process of measuring, examining, testing, gaging, or making other determinations with respect to materials, products, services, systems, or environments. *ASTM (C 390, C-16) 1968*

instability
Use stability

instantons
Field configurations of Yang-Mills theory which are localized in space and time. These configurations are solutions of the Yang-Mills field equations in Euclidean space time which allow the transitions (tunneling) from one vacuum state to another. *1981*

instrument landing systems
A system which provides, in the aircraft, a display of the lateral, longitudinal, and vertical references necessary for a landing. Used for ILS (landing systems). *SP-7 1968*

insurance (contracts)
Coverage by contract whereby one party undertakes to indemnify or guarantee another against loss by a specified contingency or peril. *1987*

integers
Whole numbers; numbers that are not a fraction. *SP-7 1968*

integral rocket ramjets
A combination of a solid propellant rocket and a ramjet which uses the empty booster case as a ramjet combustor. *1984*

integrals
Of or pertaining to an integer. *SP-7 1983*

integrated energy systems
Community systems for energy generation and distribution. *1979*

integrated optics
Thin film devices containing tiny lenses, prisms, and switches to transmit very thin laser beams, which serve the same purposes as the manipulation of electrons in thin film devices of intergrated electronics. *1977*

integrators
In digital computers, devices for accomplishing a numeric approximation of the mathematical process of integration. Devices whose output is proportional the integral of an input signal. *SP-7 1968*

intensity
In general, the degree or amount, usually expressed by the elemental time rate or spatial distribution of some condition or physical quantity, such as electric field, sound, magnetism, etc. With respect to electromagnetic radiation, a measure of the radiant flux per unit solid angle emanating from some source. Frequently, it is desirable to specify this as radiant intensity in order to distinguish it clearly from luminous intensity. *SP-7 1968*

interactive control
The sending of multiple commands that are selected on the basis of data received from an experiment in real time. *1981*

interactive graphics
Use computer graphics

intercalation
Production of layer type semiconducting as well as other conducting materials (also called synthetic metals). *1981*

interfaces
A common boundary between two parts of a system, whether material or non material. Specifically, in a rocket vehicle or other mechanical assembly, a common boundary between two components. Specifically, in fluid dynamics, a surface separating two fluids across which there is a discontinuity of some fluid property such as density or velocity or of some derivative of these properties in a direction normal to the interface. The equations of motion do not apply at the interface but are replaced by the boundary conditions. *SP-7 1968*

interfacial strain
Use interfacial tension

interfacial tension
That property, due to molecular forces, that exists in the surface film of all liquids and tends to prevent the liquid from spreading. Used for interfacial strain and surface tension. *ASTM (B 374, B-8) 1968*

interference fit
The condition where the diameter of the fastener is larger than the hole that it is to fit in. *1972*

interference monochromatization
Use diffraction

interferometers
Apparatus used to produce and measure interference from two or more coherent wave trains from the same source. Interferometers are used to measure wavelengths, to measure angular width of sources, to determine the angular position of sources (as in satellite tracking), and for many other purposes. *SP-7 1968*

interferon
A protein (lymphokine) released by cells in response to virus infection. When taken up by other cells, interferon inhibits the replication of viruses within them. *DOE 1972*

interior ballistics
That branch of ballistics that deals with the propulsion of projectiles, i.e., the motion and behavior of projectiles in a gun barrel, the temperatures and pressures developed inside a gun barrel, the temperatures and pressures developed inside a gun barrel or rocket. *SP-7 1968*

intermediate frequencies
The beat frequencies used in heterodyne receivers, usually the difference between the received radiofrequency signal and a locally generated signal. *SP-7 1969*

intermodulation
The modulation of the components of a complex wave by each other in a nonlinear system. *SP-7 1968*

internal energy
A mathematically defined thermodynamic function of state, interpretable through statistical mechanics as a measure of the molecular activity of the system. *SP-7 1968*

internal pressure
The pressure inside a portion of matter due to the attraction between molecules. *1968*

internal stress
Use residual stress

internal waves
In fluid mechanics, wave motions of stably stratified fluids in which the maximal vertical motions occur below the surface of the fluids. *1977*

International Cometary Explorer
Use international sun earth Explorer 3

International Computers Limited
Use ICL computers

International Geophysical Year
By international agreement, a period during which greatly increased observation of world-wide geophysical phenomena is undertaken through the cooperative effort of participating nations. July 1957 to December 1958 was the first such year; however, precedent was set by the International Polar Years of 1882 and 1932. Used for IGY (geophysical year). *SP-7 1968*

International Magnetospheric Study
Joint US, ESA, Japanese, and Canadian effort (1976-1979) for observation and measurement of magnetospheric and ionospheric phenomena and involving spacecraft, aircraft, balloons, and rockets, as well as ground based equipment. Used for IMS. *1977*

International Solar Polar Mission
Use Ulysses mission

international sun earth Explorer 1
First joint NASA-ESA satellite launched to investigate sun-earth relationships and solar phenomena. *1978*

international sun earth Explorer 2
Second joint NASA-ESA satellite launched to investigate sun-earth relationships and solar phenomena. *1978*

international sun earth Explorer 3
The last in a series of three spacecraft developed by NASA and ESA for the study of the magnetosphere. ISEE C was launched into a heliocentric orbit and will make observations in the solar wind up stream of the earth. Used for International Cometary Explorer. *1978*

International System of Units
The metric system of units based on the meter, kilogram, second, ampere, Kelvin degree, and candela. Other SI units are hertz, radian, newton, joule, watt, coulomb, volt, ohm, farad, weber and tesla. Used for metric system and SI. *SP-7 1968*

interplanetary propulsion
Use rocket engines

interprocessor communication
Communication between two or more processors in a computer system. *1981*

intersections
In Boolean algebra, the operation in which concepts are described by stating that they have all the characteristics of the classes involved. Intersection is expressed as AND. *SP-7 1968*

interstellar chemistry
Molecular formation/dissociation in interstellar space due to radiation, collision, and other forces. *1977*

intraorbit transfer vehicles
Small scooter type tugs that would move men and materials within an orbit. *1982*

invalidity
Use errors

inverse scattering
Method for analyzing some classic wave scattering. *1981*

Io
A satellite of Jupiter orbiting at a mean distance of 421,800 kilometers. Also called Jupiter I. *SP-7 1968*

ion beams
Directed fluxes of charged atoms or molecules. *ASTM (E 673, E-42) 1968*

ion chambers
Use ionization chambers

ion density (concentration)
In atmospheric electricity, the number of ions per unit volume of a given sample of air; mmore particularly, the number of ions of a given type (positive small ion, negative small ion, positive large ion, or negative large ion) per unit volume of air. *SP-7 1968*

ion engines
Reaction engines in which ions, accelerated in an electrostatic field, are used as propellants. Used for ionic propellants and thermionic reactors. Also called electrostatic engines. Used for ionic propellants and thermionic reactors. *SP-7 1968*

ion gages
Use ionization gages

ion spectrometers
Use mass spectrometers

ion storage
Ions within an electromagnetic trap and cooled to sub-Kelvin temperatures with lasers. Potential uses are for frequency standards. *1980*

ion stripping
A procedure following the focusing of ion beams in the target chamber of a reactor to be used for particle beam pellet fusion. *1981*

ionic mobility
In gaseous electric conduction, the average velocity with which a given ion drifts through a specified gas under the influence of an electric field of unit strength. Mobilities are commonly expressed in units of centimeters per second per volt per centimeter. *SP-7 1968*

ionic propellants
Use ion engines

ionization
The process by which electrons are lost from or transferred to neutral molecules or atoms to form positively or negatively charged particles. Used for electron ionization. *ASTM (D 1711, D-9) 1968*

ionization chambers
Apparatus used to study the production of small ions in the atmosphere by cosmic ray and radioactive bombardment of air molecules. Used for ion chambers and ionization counters. *SP-7 1968*

ionization counters
Use ionization chambers
radiation counters

ionization gages
Vacuum gages with a means of ionizing the gas molecules and a means of correlating the number and type of ions produced with the pressure of the gas. Various types of ionization gages are distinguished according to the method of producing the ionization. Used for ion gages. *SP-7 1968*

ionization potentials
The energy required to ionize an atom or molecule. The energy is usually given in terms of electron volts. *SP-7 1968*

ionized plasmas
Use plasmas (physics)

ionizers
Filaments, grids, or porous bodies in ion engines or other devices which strip an electrons from the outer shells of neutral atoms to form positively charged ions. *SP-7 1968*

ionizing radiation
Any electromagnetic or particulate radiation capable of producing ions, directly or indirectly, in its passage through matter. *SP-7 1968*

ionopause
The upper boundary of the ionosphere of certain planets (excluding the earth) and comets where electrons decline sharply. The earth's ionopause is referred to as the plasmapause. (Excludes plasmapause). *1983*

ionospheric storms
Disturbances of the ionosphere, resulting in anomalous variations in its characteristics and effects on radio communication. *SP-7 1968*

ionospheric tilts
Ionospheric conditions where the variability of the number of the electrons as a function of altitude is present. Ionospheric tilts are sometimes created by traveling ionospheric disturbances (TID's) and ionospheric tilts deflect radio waves in unexpected directions adversely affecting radio reception. *1982*

ions
Charged atoms or molecularly bound groups of atoms; sometimes also free electrons or other charged subatomic particles. In atmospheric electricity, any of several types of electrically charged submicroscopic particles normally found in the atmosphere. Atmospheric ions are of two principal types, small ions and large ions, although a class of intermediate ions has occasionally been *reported. In chemistry, atoms or specific groupings of atoms* which have gained or lost one or more electrons, as the chloride ion or ammonium ion. Such ions exist in aqueous solutions and in certain crystal structures. *SP-7 1968*

IP (impact prediction)
Use computerized simulation

IRAS
Use infrared astronomy satellite

IRAS-Araki-Alcock comet
The closest known approaching comet to the earth since 1770, it was the fourth comet discovered in 1983 and is named after its first three discoverers: The infrared astronomy satellite, Genichi Araki (a Japanese school teacher) and George Alcock (a veteran English amateur observer). *1983*

iron 58
A radioactive isotope of iron. *1981*

irradiance
The detection rate per unit area of radiation. *1968*

irregular galaxies
Galaxies with amorphous structure and with relatively low mass (10 to the 8th to 10 to the 10th solar masses). Fewer than 10% *of all galaxies are classified as irregular.* *1985*

isentrope
A line of equal or constant pressure, with respect to either space or time. *SP-7 1968*

isobars (pressure)
Lines of equal or constant pressure, specifically such lines on a weather map. *SP-7 1968*

isomerization
Process for converting hydrocarbon or other organic compound to an isomer. *DOE 1968*

isomers
Nuclides having the same mass number A and atomic number Z, but existing for measurable times in different quantum states with *different energies and radioactive properties. Molecules having the* same atomic composition and molecular weight, but differing in geometrical configuration. *SP-7 1968*

isoparametric finite elements
The basis for the calculation of physical properties of structural shapes including stress analyses. *1981*

isopleths
Use nomographs

isostasy
A supposed equality existing in vertical sections of the earth, whereby the weight of any column from the surface of the earth to a constant depth is approximately the same as that of any other column of equal area, the equillibrium being maintained by plastic flow from one part of the earth to the another. *SP-7 1968*

isotensoid structures
Filamentary structures in which the filaments are uniformly stressed throughout for the design loading conditions. *SP-7 1968*

isothermal processes
Thermodynamic changes of state of a system that take place at constant temperature. *SP-7 1968*

isotherms
Lines connecting points of equal temperature. *DOE 1968*

isotopes
Nuclides having the same number of protons in their nuclei, and hence belong to the same element, but differing in the number of and therefore in mass number A, or in energy content (isomers). Radionuclides or preparations of an element with special isotopic composition (allobar) as an article of commerce, so called because of the principal use of such materials as radioactive tracers. *SP-7 1968*

isotopic enrichment
Process by which the relative abundance of the isotopes of a given element are altered in a batch to produce a form of the element enriched in a particular isotope. *1979*

isotropic turbulence
Turbulence in which the products and squares of the velocity components and their derivatives are independent of direction, or, more precisely, invariant with respect to rotation and reflection of the coordinate axes in a coordinate system moving with the mean motion of the fluid. *SP-7 1968*

isotropy
Having the same properties in all directions. Used for spatial isotropy. *ASTM (D 653, D-18) 1968*

ITO (semiconductors)
Semiconductor devices consisting of a layer of tin sandwiched between an indium layer and an oxide layer. Used for indium-tin-oxide semiconductors. *1986*

Izsak ellipsoid
Use ellipsoids
geodesy

J

J integral
A contour energy integral formulated by Rice and used for evaluating fracture toughness of elastoplastic materials. *1979*

jackets
Coverings or casings of some kind. Specifically, a shell around the combustion chamber of a liquid fuel rocket, through which the propellant is circulated in regenerative cooling. Coatings of one material over another to prevent damage such as oxidationor micrometeroid penetration. *SP-7 1968*

Jahn-Teller effect
The effect whereby, except for linear molecules, degenerate orbital states in molecules are unstable. *1981*

jamming
Intentional transmission or reradiation of radio signals in such a way as to interfere with reception of desired signals by the intended receiver. *SP-7 1968*

Janus
One of the natural satellites of Saturn. *1980*

Japanese spacecraft
Spacecraft operated by the Japanese government. Used for MOS (Japanese spacecraft). *1983*

jet airstreams
Use jet streams (meteorology)

jet damping
Use damping

jet engines
Broadly, engines that eject jets or streams of gas or fluids, obtaining all or most of their thrust by reaction to the ejection. Specifically, aircraft engines that derive all or most of their thrust by reaction to their ejection of combustion products (or heated air) in a jet and that obtains oxygen from the atmosphere for the combustion of their fuel (or outside air for heating, as in the case of the nuclear jet engine), distinguished in this sense from a rocket engine. Jet engines of this kind may have compressors, commonly turbine driven, to take in and compress air (turbojets), or they may be compressorless, taking in and compressing air by other means (pulsejets, ramjets). *SP-7 1968*

jet lag
Desynchronization of biological rhythms because of transmeridian flight. *1980*

jet membrane process
Method for separating or enriching isotopes of the same element by using a condensible vapor as the carrier fluid. A process gas containing the isotopes enters a chamber into which a heavy condesible gas (the jet) flows. The lighter of the two isotopesis enriched relative to the heavier species and is collected by a probe downstream for further enrichment or analysis. *1979*

jet streams (meteorology)
Strong bands of wind or winds in the upper troposphere or in the stratosphere, moving in a general direction from west to east and often reaching velocities of hundreds of miles an hour. Used for jet airstreams. *SP-7 1968*

jet thrust
The thrust of a fluid, especially as distinguised from the thrust of a propeller. Used for reaction jets. *SP-7 1968*

jet vanes
Vanes either fixed or movable, used in a jetstream, especially in the jetstream of a rocket, for purposes of stability or control under conditions where external aerodynamic controls are ineffective. Also called blast vane. *SP-7 1968*

jetavators
Use guide vanes

JFET
Junction field effect transistors in which semiconductor channels of low conductivity join the source and drain and in which these channels are reduced and cut off by the junction depletion regions, which reduce the conductivity and cause a voltage to be applied between the gate electrodes. Used for junction field effect transistors. *1980*

jitter
Use vibration

Jodrell Bank Observatory
A large radio telescope, located near Manchester, England. *SP-7 1968*

Joule-Thomson effect
A change of temperature in a gas undergoing Joule-Thomson expansion. *DOE 1968*

jumpers
Short lengths of conductors used to complete electrical circuits, usually temporary, between terminals, or bypassing an existing circuit. *SP-7 1968*

junction field effect transistors
Use JFET

junctions
In semiconductor devices, regions of transition between semiconducting regions of different electrical properties. *SP-7 1968*

Jupiter rings
Ring structures around the planet Jupiter discovered on March 4, 1979 by Voyager 1. *1980*

Jupiter satellites
Any or all of the natural satellites surrounding the planet Jupiter. *1982*

K

kaolinite
A hydrous silicate of aluminum. It constitutes the principle mineral in kaolin. *DOE 1968*

Karman vortex street
A double trail of vortices formed alternately on both sides of a cylinder of similar body moving at right angles to its axis through a fluid, the vortices in one row rotating in a direction opposite to that of the other row. (After Theodore von Karman, 1881-1963, Hungarian born American scientist). *SP-7 1968*

Kepler laws
The three empirical laws governing the motions of the planets in their orbits, discovered by Johannes Kepler (1571-1630). These are: (a) the orbits of the planets are ellipses, with the sun at a common focus; (b) as a planet moves in its orbit, the line joining the planet and the sun sweeps over equal areas in equal intervals of time (also called law of equal areas); (c) the squares of the periods of revolution of any two planets are proportional to the cubes of their mean distances from the sun. *SP-7 1968*

Kevlar (trademark)
A Dupont synthetic textile material, lightweight and nonflammable, and with high impact resistance. *1977*

kilometric waves
Electromagnetic waves with wavelengths between 1,000 and 10,000 meters. *1980*

kimberlite
Use biotite

kinematics
The branch of mechanics dealing with the description of the motion of bodies or fluids without reference to the forces producing the motion. *SP-7 1968*

kinetic energy
The energy which a body posesses as a consequence of its motion. Used for momentum energy. *SP-7 1968*

kinetic theory
The derivation of the bulk properties of fluids from the properties of fluids from the properties of their constituent molecules, their motions and interactions. *SP-7 1968*

Kirchhoff law of radiation
The radiation law which states that at a given temperature the ratio of the emissivity to the absorbtivity for a given wavelength is the same for all bodies and is equal to the emissivity of an ideal black body at that temperature and wavelength. *SP-7 1968*

Kirchhoff-Huygens principle
Use diffraction

klystrons
Electron tubes for converting direct current energy into radio frequency energy by alternately speeding up and slowing down the electrons. *SP-7 1968*

knowledge engineering
Use expert systems

knowledge representation
The use of symbolic data structures to represent knowledge so that a computer can manipulate them. *1987*

Knudsen cells
Use Knudsen gages

Knudsen gages
Gages which measure pressure in terms of the net rate of transfer of momentum by molecules between two surfaces maintained at different temperatures and separated by a distance smaller than the mean free path of the gas molecules. Used for Knudsen cells. *1968*

kondo effect
Change in superconductivity characteristics resulting from magnetic impurities in the compounds involved. *1980*

Korteweg-Devries equation
The mathematical representation describing the propagation of long waves of small but finite amplitude. *1978*

kraft process (woodpulp)
Woodpulping process in which sodium sulfate is used in the caustic soda pulp-digestion liquor. Also known as sulfate pulping or kraft pulping. *1977*

Kramers-Kronig formula
The relationship between the attenuation coefficient and the dispersion (frequency dependent phase velocity) for viscoelastic waves. *1980*

kreep
A yellow-brown glassy lunar mineral enriched in potassium, rare earth elements, and phosphate. *1979*

kriging
A method of providing unbiased estimates of variables in regions where the available data exhibit spatial autocorrelation, and these estimates are obtained in such as way that they have minimum variance. *1981*

krypton fluoride lasers
Rare gas halide ultraviolet stimulated emission devices in which krypton fluoride is the active lasing medium. *1978*

kurtosis
In statistics, the extent to which a frequency distribution is peaked or concentrated about the mean; it is sometimes defined as the ratio of the fourth moment of the distribution to the square of the second moment. *1978*

L

L-Sat
A communications satellite designed by European Space Agency member states to meet future communications satellite market needs such as European broadcast services, global telecommunications trunk services, and mobile services. Used for European Large Telecomm Satellite. *1983*

labyrinth seals
Minimum leakage seals that offer resistance to fluid flow while providing radial or axial clearance. *1981*

Lacate (experiment)
A NASA balloonborne experiment conducted from a balloon platform carried by a balloon over 400 feet in diameter. The acronym stands for the lower atmospheric composition and temperature experiment. The experiment was conducted in 1974. Used for Lower Atmospheric Composition Experiment. *1981*

lag (delay)
Use time lag

Lagrange coordinates
Systems of coordinates by which fluid parcels are identified for all times by assigning them coordinates which do not vary with time. Examples of such coordinates are: (a) the values of any properties of the fluid conserved in the motion; or (b) more generally, the positions in space of the parcels at some arbitrarily selected moment. Subsequent positions in space of the parcels are then the dependent variables, functions of time and of the Lagrange coordinates. Also called material coordinates. *SP-7 1968*

Lamb waves
Waves that propagate within the thickness of a thin plate, and that can only be generated at particular values of angle of incidence, frequency, and plate thickness. The velocity of the wave is dependent on the mode and the product of plate thickness and frequency. *ASTM (E 500, E-7) 1968*

Lambert law
Use Bouguer law

lamella (metallurgy)
Crystalline materials whose grains are in the form of thin sheets. *1980*

laminar boundary layer
In fluid flow, layer next to the fixed boundary. The fluid velocity is zero at the boundary layer but the molecular viscous stress is large because the velocity gradient normal to the wall is large. Used for laminar boundary layer separation and laminar flow control. *SP-7 1968*

laminar boundary layer separation
Use laminar boundary layer

laminar flames
Use laminar flow

laminar flow
In fluid flow, a smooth flow in which no crossflow of fluid particles occurs between adjacent stream lines; hence, a flow conceived as made up of layers -- commonly distinguished from turbulant flow. Used for laminar flames, laminar jets, Poiseuille flow, and streamline flow. *SP-7 1968*

laminar flow control
Use laminar boundary layer

laminar jets
Use laminar flow

laminated materials
Use laminates

laminates
Products made by bonding together two or more layers of material or materials. Used for laminated materials, laminations, and multilayer structures. *ASTM (C 582, C-3) 1968*

laminations
Use laminates

LAN (computer networks)
Use local area networks

land mobile satellite service
A proposed radio relay satellite system for serving thinly populated or large geographical areas. *1981*

Landau damping
The damping of a space charge wave by electrons which move at the phase velocity of the wave and gain energy transferred from the wave. *SP-7 1968*

landfills
Disposal sites for solid wastes which are buried in layers of earth. *1981*

landing gear
The apparatus comprising those components of an aircraft or spacecraft that support and provide mobility for the craft on land, water, or other surface. The landing gear consists of wheels, floats, skiis, bogies, and treads, or other devices, together with all associated struts, bracing, or shock absorbers. Used for retractable landing gear. *SP-7 1968*

Landsat 3
The third Landsat satellite (Landsat C) successfully launched and in orbit. Used for Earth Resources Technology Satellite C and ERTS-C. *1978*

lapse rate
The decrease of an atmospheric variable with height, the variable being temperature unless otherwise specified. The term applies ambiguously to the environmental lapse rate and the process lapse rate, and the meaning must often ascertained from the context. *SP-7 1968*

Large Infrared Telescope on Spacelab
Use LIRTS (telescope)

larmor radius
For a charged particle moving transversely in a uniform magnetic field, the radius of curvature of the projection of its path on a plane perpendicular to the field. *1978*

laser anemometers
Measuring instruments in which the wind being measured passes through two perpendicular light beams and the resulting change in velocity of one or both beams is measured. *1977*

laser annealing
Rapid heating of metals and/or alloys with the use of lasers. *1980*

laser cutting
The cutting of material by means of lasers. *1981*

laser guidance
Guidance system for rockets or projectiles, utilizing a laser beam for a precise trajectory to a designated target. *1977*

laser gyroscopes
Ring-laser angular rotation sensors for stabilizing and controlling large space structures, for space vehicle guidance, etc. *1980*

laser induced fluorescence
Emission of electromagnetic radiation that is caused by the flow of laser radiation into the emitting body and which ceases abruptly with the excitation. Used for LIF (fluorescence). *1985*

laser interferometry
The design and use of interferometers in which a laser is the light source. The monochromaticity and brilliance of the laser light enables the differentiation between interfering beams of hundreds of meters, in contrast to a maximum of 20 centimeters for the classical interferometers. *1980*

laser microscopy
The application of a laser microscope having a ceramic tube in which a metal vapor is formed at 1600 degrees C. Copper (or other metal atoms) are excited and amplify light so that, when used with a projection microscope, the object to be magnified is illuminated. The power of the emitted beam on the screen remains constant. *1978*

laser plasma interactions
The results of the actions of laser beams on electrically ducting fluids, such as plasmas or ionized gases. *1977*

laser propulsion
The use of high power lasers for aircraft, rocket, or spacecraft propulsion by indirect conversion of laser heated propellants or working fluids to produce thrust; direct thrust generation with laser light pressure on the vehicle; direct conversion of laser energy into electricity for propulsion. *1979*

laser pumping
The application of a laser beam of appropriate frequency to a laser medium so that absorption of the radiation increases the population of atoms or molecules in higher energy states. *1977*

laser spectrometers
Spectrometers that use a laser. *1981*

laser spectroscopy
The use of lasers for spectroscopic analysis; particularly in Raman spectroscopy. *1978*

laser stability
Characteristic of a laser beam free from oscillations. *1980*

laser target designators
Laser equipment aboard spacecraft for identifying satellites, missiles, and objects in space. *1978*

laser target interactions
Interactions where lasers are used to produce heating, fusion, or damage in targets. *1981*

laser targets
Objects subjected to laser radiation, especially for laser fusion applications. *1979*

laser weapons
Military applications of high power lasers (mainly gasdynamic and chemical mixing lasers). *1979*

laser welding
Microspot welding with a laser beam. *1977*

lasers
Devices for producing light by emission of energy stored in a molecular or atomic system when stimulated by an input signal. (From Light Amplification by Stimulated Emission of Radiation.) Used for Fabry-Perot lasers, natural lasers, and optical masers. *SP-7 1968*

lasing
Generation of visible or IR light waves having very nearly a single frequency by pumping or exciting electrons into high energy states in a stimulated emission device (laser). *1978*

latch-up
A pnpn self-sustaining low impedence state which is a type of electronic malfunction. *1981*

latches
Devices that fasten one thing to another, as a rocket to a launcher, but are subject to ready release so that things may be separated. *SP-7 1968*

latent heat
The unit quantity of heat required for isothermal change in a state of a unit mass of matter. Latent heat is termed heat of fusion, heat of sublimation, heat of vaporization, depending on the change of state involved. *SP-7 1968*

latent heat of fusion
Use heat of fusion

Latin square method
In mathematics, the use of an n x n square array of n different symbols, each symbol appearing once in each row and once in each column. *1977*

latitude
Angular distance from a primary great circle or plane. *SP-7 1968*

launch clouds
Use exhaust clouds

launch complexes
Use launching bases

launch time
Use launch windows

launch windows
The postulated openings in the continuum of time or of space, through which a spacecraft or missle must be launched in order to achieve a desired encounter, rendezvous, impact or the like. Used for launch time. *SP-7 1968*

launchers
Specifically, structures or devices, often incorporating tubes, a group of tubes, or a set of tracks, from which self-propelled missiles are sent forth and by means of which the missiles usually are aimed or imparted initial guidance -- distinguished in this specific sense the catapult. Broadly, structures, machines, or devices, including catapults, by means of which airplanes, rockets, or the like are directed, hurled, or sent forth. Used for launching devices. *SP-7 1968*

launching bases
Areas such as Cape Kennedy or Vandenburg Air Force Base that has several launch sites. Used for launch complexes. *SP-7 1968*

launching devices
Use launchers

launching pads
The load-bearing base or platform from which a rocket vehicle is launched. *SP-7 1968*

launching sites
Defined areas from which a rocket vehicle is launched, either, operationally or for test purposes; specifically, at Cape Kennedy or Vandenberg, any of the several areas equipped to launch a rocket. *SP-7 1968*

lava
A general term for a molten extrusive; also, for the rock that is solidified from it. *DOE 1968*

lay-up
Production of reinforced plastics by positioning the reinforced material (such as glass) in the mold prior to impregnation with resin. *1981*

lead acid batteries
The common automobile batteries in which the electrodes are grids of metallic lead containing lead oxides that change in composition during charging and discharging. The electrolyte generally is dilute sulfuric acid. *1978*

lead zirconate titanates
Dense ceramics with high piezoelectric coefficients and a high relative permittivity. *1980*

leading edge flaps
Control surfaces at the leading edges of airfoils. Hinged panels deflected downward to induce and control separation of the air flow. *1980*

leading edge thrust
The increase in lift produced by highly swept, low-aspect ratio wings which develop a strong separation vortex; however, an even larger increase in drag is produced. *1980*

leasing
Contracting for the use and possession of land, buildings, etc. for a specified time and fixed payments. *1980*

least squares method
Any statistical procedure that involves minimizing the sum of squared differences. *SP-7 1968*

length
The larger of the two dimensions of the open face.
ASTM (D 2658, D-10) 1968

lenses
Transparent optical elements, so constructed that they serve to change the degree of convergence of the transmitted rays.
ASTM (E 175, E-25) 1968

leptons
In the classification of subatomic particles according to mass, the lightest of all particles; examples of leptons are the electron and positron. *SP-7 1968*

levitation melting
A metallurgical process in which a piece of metal placed above a coil carrying a high frequency current can be supported against gravity by the Lorentz force caused by the induced surface currents in the metal. At the same time, the heat produced by Joule dissipation melts the metal. *1983*

libration
A real or apparent oscillatory motion, particularly the apparent oscillation of the moon. Because of libration more than half of the moon's surface is revealed to an observer on the earth even though the same side of the moon is always toward the earth, because the moons periods of rotation and revolution are the same. Other motions regarded as librations are long period orbital motions and periodic perturbations in orbital elements. *SP-7 1968*

LIF (fluorescence)
Use laser induced fluorescence

life (biology)
Use life sciences

life cycle costs
The sum of the acquisition costs and maintenance costs for the life of a system. *1978*

life sciences
The field of scientific disciplines encompassing biology, physiology, psychology, medicine, sociology, and other related areas. Used for life (biology). *SP-7 1968*

lift
That component of the total aerodynamic force acting on a body perpendicular to the undisturbed airflow relative to the body. To lift off, to take off in vertical ascent. Said of rocket vehicles. Used for aerodynamic lift, lift coefficients, lift distribution, lift forces, and variable lift. *SP-7 1968*

lift coefficients
Use aerodynamic coefficients
lift

lift distribution
Use lift

lift drag ratio
The ratio of lift to drag obtained by dividing the lift by the the drag of the lift coefficient by the drag coefficient. Used for drag balance. *SP-7 1968*

lift forces
Use lift

light (visible radiation)
Visible radiation (about 0.4 to 0.7 microns in wavelength) considered in terms of its luminous efficiency, i.e., evaluated in proportion to its ability to stimulate the sense of sight. Used for extragalactic light, optical spectrum, and visible radiation. *SP-7 1968*

light duration
Use pulse duration

light intensity
Use luminous intensity

light ions
Ions of helium, boron, and other elements used in implantation experiments. *1981*

light pressure
Use illuminance

light transport aircraft
A classification of multiengine airplanes having a maximum passenger capacity of 30 seats and a gross weight of about 35,000 pounds. *1979*

light valves
Optical shutters which, when activated by light, become either transparent or opaque. *1983*

light water
Water in which both hydrogen atoms in each molecule are of the isotope protium. Used for protium. *1979*

light water reactors
Nuclear reactors using ordinary (rather than heavy) water as moderator. *1981*

lignin
That part of plant material which is not saccharified by the action of 72% sulfuric acid or 42% hydrochloric acid, after the resins, waxes, and tannins have been removed.
ASTM (D 1695, D-23) 1968

lignite
Coal of relatively recent origin, an intermediate between peat and bituminous coal. *1979*

likelihood ratio
The probability of a random drawing of a specified sample from a population, assuring a given hypothesis about the parameters of the population, divided by the probability of a random drawing of the same sample, assuring that the parameters of the population are such that this probability is maximized. *1981*

limb brightening
The increase in the intensity of radio or x ray brightness of the sun or other stars from its center to its limb. *1981*

limb darkening
A condition, sometimes observed on celestial bodies, in which the brightness of the object decreases as the edges or limbs of the object are approached. The sun and Jupiter exhibit limb darkening. *SP-7 1968*

limen
Threshold; a psychophysical concept denoting the lowest detectable intensity of any sensory stimulus. *SP-7 1968*

limestone
Sedimentary rock composed principally of calcium carbonate (the mineral calcite) or the double carbonate of calcium and magnesium (the mineral dolomite) or mixture of the two.
ASTM (C 568, C-18) 1968

limiters (fusion reactors)
Material aperture in fusion power reactors which collect particles from the outer surfaces of the plasmas to control their transport to regions of low density. *1980*

limnology
The physical, chemical, meteorological, and especially the biological and ecological conditions in inland waters. *DOE 1972*

line of sight
An aim or observation taken with mechanical or optical aid to establish a direct path to an objective, target, etc. *1980*

line of sight communication
Electromagnetic wave propagation, usually microwaves, in a straight line between the transmitter and receiver. The useful transmission distance is generally limited to the horizon as sighted from the elevation of the transmitter. *1977*

line spectra
The spontaneous emission of electromagnetic radiation from the bound electrons as they jump from high to low energy levels in an atom. Used for spectral lines. *SP-7 1968*

linear accelerators
Devices for accelerating charged particles employing alternate electrodes and gaps arranged in a straight line, so proportioned that when their potentials are varied in the proper amplitudes and frequency, particles passing through them receive successive increments of energy. *SP-7 1968*

linear arrays
Antenna arrays whose elements are equally spaced along a straight line. *SP-7 1968*

linear evolution equations
Denotes a large class of differential or integral differential equations which are used to describe the evolution in time of some physical systems from an initial state. The equation is said to be linear if the unknown functions and their derivatives appear linearly. *1981*

linear polarization
Polarization of an electromagnetic wave in which the electric vector at a fixed point in space remains pointing in a fixed direction although varying in magnitude. Also known as plane polarization. *1977*

linear quadratic Gaussian control
A type of optimal-state feedback control whose design considers noise. It is primarily used to control aircraft and spacecraft systems. Used for LQG control. *1987*

linear quadratic regulator
A type of optimal-state feedback controller that does not consider noise. It is primarily used to control aircraft and spacecraft. Used for linear regulator and LQR. *1987*

linear regulator
Use linear quadratic regulator

linearity
The maximum deviation between an actual instrument reading and the reading predicted by a straight line drawn between upper and lower calibration points; usually expressed as a percentage of the full scale. *ASTM (D 3162, D-22) 1968*

liquid drops
Use drops (liquids)

liquid phase epitaxy
A liquid phase transformation during crystal growth. *1980*

liquid plus solid zones
Use mushy zones

liquid propellant rocket engines
Rocket engines using a propellant or propellants in liquid form. *SP-7 1968*

liquid rocket propellants
Specifically, rocket propellants in liquid form. Examples of liquid propellants include fuels such as alcohol, gasoline, aniline, liquid ammonia, and liquid hydrogen; oxidants such as liquid oxygen, hydrogen peroxide (also applicable as a monopropellant), and nitric acid; additives such as water; and monopropriiants such as nitromethane. Used for bipropellants and tripropellants. *SP-7 1968*

liquid sloshing
The back and forth movement of a liquid fuel in its tank, creating problems of stability and control in the vehicle. Used for sloshing. *SP-7 1968*

liquid wastes
The liquid counterpart of solid wastes from industrial, chemical, metabolic, and/or mineral sources. *1979*

liquids
Substances in a state in which the individual particles move freely with relation to each other and take the shape of the container, but do not expand to fill the container. *SP-7 1968*

LIRTS (telescope)
A proposed large infrared telescope for Spacelab superseded by the German infrared laboratory. Used for Large Infrared Telescope on Spacelab. *1977*

lissajous figures
Figures where the path of a particle moving in a plane when the components of its position along two perpendicular axes each undergo simple harmonic motions and the ratio of their frequencies is a rational number. *1982*

lithium iodates
Salts of iodic acid containing the 10 to the third power radical. *1977*

lithium sulfur batteries
Primary cells for producing electrical energy using lithium metal for one electrode and sulfur for the other. *1977*

lithography
The process of printing from a plane surface on which the image to be printed is ink receptive and water repellant and the non-image area is ink repellant and water receptive. *ASTM (F 425, F-5) 1968*

lithology
Description of the physical character of a rock as determined by eye or with a low-power magnifier and based on color, structure, mineralogic components, and grain size. *DOE 1968*

lixiscopes
Portable light weight battery operated low intensity x ray imaging systems with medical, industrial, and scientific applications. Used for Low Intensity X Ray Imaging Scopes. *1981*

local area networks
Networks, generally microcomputer based, that enable users in the the same location to use the same programs and equipment such as printers. Used for LAN (computer networks). *1987*

local group (astronomy)
The cluster of galaxies to which our galaxy belongs. It is a poor, irregular cluster with some 20 certain members including the Milky Way Galaxy, the Andromeda Galaxy, the Triangulum, four irregular galaxies, and about 13 intermediate or dwarf ellipticals. *1984*

logarithms
The power to which a fixed number, called the base, usually 10 or e (2.7182818) must be raised to produce the value to which the logarithm corresponds. *SP-7 1968*

logging (industry)
The business of felling trees, cutting them up into logs and transporting the logs to sawmills or to a place of sale. *1981*

logical elements
In computers or data processing systems, the smallest building blocks which can be represented by operators in an appropriate system of symbolic logic. Typical logical elements are the AND gate and flip-flop, which can be represented as operators in a suitable symbolic logic. Used for decision elements. *SP-7 1968*

long duration space flight
Space flight involving interplanetary and/or interstellar travel. Used for extended duration space flight. *1979*

long period variables
Use Mira variables

long range navigation
Use loran

long waves (meteorology)
Use planetary waves

longitude
Angular distance, along a primary great circle, from the adopted reference point; the angle between a reference plane through the polar axis and a second plane through that axis. *SP-7 1968*

longitudinal waves
Waves in which the direction of displacement at each point of the medium is normal to the wave front. *SP-7 1968*

look angles (electronics)
The solid angle in which an instrument operates effectively, generally used to describe radars, optical instruments, and space radiation detectors. *1976*

look angles (tracking)
The elevation and azimuth at which a particular satellite is predicted to be found at a specified time. *1976*

loran
A two dimensional pulse synchronized radio navigation system to determine hyperbolic lines of position through pulse time differencing from a master compared to two slave stations. Used for long range navigation. *SP-7 1968*

Lorentz force
The force affecting a charged particle due to the motion of the particle in a magnetic field. *SP-7 1968*

lossless materials
Dielectric materials that do not dissipate energy or that do not dampen oscillations. *1968*

lossy media
A material that dissipates energy of electromagnetic or acoustic energy passing through it. *1981*

loudness
The intensive attribute of an auditory sensation, in terms of which sounds may be ordered on a scale extending from soft to loud. Loudness is measured in sones. Loudness depends primarily upon the sound pressure of the stimulus, but it also depends upon the frequency and waveform of the stimulus. *SP-7 1968*

low carbon steels
Iron alloys containing carbon in low percentages that display temper and malleability characteristics not found in ordinary carbon steels. *1980*

low gravity
Use reduced gravity

Low Intensity X Ray Imaging Scopes
Use lixiscopes

low mass
Use mass

low pass filters
Wave filters having a single transmission band extending from zero frequency up to some critical or bounding frequency, not infinite. *SP-7 1968*

low Reynolds number
A Reynolds number below the critical Reynolds number of a sphere. *1982*

low vacuum
The condition in a gas filled space at pressures less than 760 torr corresponding approximately to the vapor pressure of water at 25 deg. C and to 1 inch of mercury. *SP-7 1968*

lower atmosphere
Generally, and quite loosely, that part of the atmosphere in which most weather phenomena occur (i.e., the troposphere and lower stratosphere); hence, used in contrast to the common meaning for the upper atmosphere. *SP-7 1968*

Lower Atmospheric Composition Experiment
Use Lacate (experiment)

lower body negative pressure
Application and/or measurement of reduced pressure in the portion of the body below the iliac crests. Used as a simulator or orthostatic stress or as an indicator of cardiovascular deconditioning in a weightless environment. *1979*

lox-hydrogen engines
Use hydrogen oxygen engines

LQG control
Use linear quadratic Gaussian control

LQR
Use linear quadratic regulator

lubricants
Substances interposed between two surfaces for the purpose of reducing the friction or wear between them.
ASTM (G 40, G-2) 1968

Ludox (trademark)
Composite material utilizing colloidal silica matrixes. *1981*

lumens
Units of luminous flux equal to the luminous flux radiated into a unit solid angle (steradian) from a point source having a luminous intensity of 1 candela. *SP-7 1968*

luminance
In photometry, a measure of the intrinsic luminous intensity emitted by a source in a given direction; the illuminance produced by light from the source upon a unit surface area oriented normal to the line of sight at any distance from the source, divided by the solid angle subtended by the source at the receiving surface. Also called brightness but luminance is preferred. *SP-7 1968*

luminescence
Light emission by a process in which kinetic heat energy is not essential for the mechanism of excitation. Used for glow and noctilucence. *SP-7 1968*

luminescent intensity
Use luminous intensity

luminous flux density
Use luminous intensity

luminous intensity
Luminous energy per unit time per unit solid angle; the intensity (flux per unit solid angle) of visible radiation weighted to take into account the variable response of the human eye as a function of the wavelength of light; usually expressed in candles. Used for light intensity, luminescent intensity, and luminous flux density.
SP-7 1968

lumped parameter systems
Systems in which the parameters may be considered to represent, for purposes of analysis, a single inductance, capacitance, resistance, etc., throughout the frequency range of interest. *1981*

LUNA lunar probes
Use lunik lunar probes

lunar craters
A depression, usually circular, on the surface of the moon, usually with a raised rim called a ringwall. *SP-7 1968*

lunar eclipses
The phenomenon observed when the moon enters the shadow of the earth. *SP-7 1968*

lunar probes
Probes for exploring and reporting on conditions on or about the moon. *SP-7 1968*

lunar scattering
Use diffuse radiation

lunation
Use month

lunik lunar probes
Russian term for a space probe launched to the moon's vicinity or to impact on the moon. Used for LUNA lunar probes. *SP-7 1968*

luster
The appearance characteristic of a specimen due to pronounced changes in intensity of light reflected from elemental areas of the specimen when the angle of illumination or view is changed. Used for dullness. *ASTM (E 284, E-12) 1968*

Lyman alpha radiation
The radiation emitted by hydrogen at 1216 angstrom, first observed in the solar spectrum by rocket borne spectrographs. Lyman alpha is very important in the heating of the upper atmosphere thus affecting other atmospheric phenomena. *SP-7 1968*

lysimeters
Instruments for measuring the water percolating through soils and determining the materials dissolved by the water. *1981*

M

Mach cones
The cone shaped shock waves theoretically emanating from an infinitesmally small particle moving at supersonic speed through a fluid medium. It is the locus of the Mach lines. The cone shaped shock waves generated by a sharp pointed body, as at the nose of a high speed aircraft. *SP-7 1968*

Mach number
A number expressing the ratio of the speed of a body or a point on a body with respect to the surrounding air or other fluid, or other fluid, or the speed of a flow, to the speed of sound in the medium; the speed represented by this number. Used for critical Mach number and Glauert coefficient. *SP-7 1968*

Mach reflection
The reflection of a shock wave from a rigid wall in which the shock strength of the reflected wave and the angle of reflection both have the smaller of the two values theoretically possible. *1977*

machine recognition
Use artificial intelligence

macromolecules
Use molecules

Magellan Mission (ESA)
Use Magellan ultraviolet astronomy satellite

Magellan project (NASA)
A Venus exploratory mission to acquire radar imagery and topographic profiles of the planet surface and determine the characteristicsof the Venusian gravity field. (This term is used to designate general project reviews, chronologies, and project management and planning.) Used for Venus Radar Mapper Project. *1986*

Magellan spacecraft (NASA)
A Venus probe incorporating Voyager and Galileo hardware designs equipped with a synthetic aperture radar system to acquire surface imagery, altimetric profiles, and surface radiothermal emissivities. Earth-based Doppler radio tracking of the spacecraft will be used to derive gravimetric data. (This term designates the spacecraft intrinsic and support hardware, instrumentation acquired data.) Used for Venus Radar Mapper. *1986*

Magellan ultraviolet astronomy satellite
This ESA mission will provide high resolution spectra of celestial sources down to sixteenth magnitude over the extreme ultraviolet wavelength range (between 50 and 150 nm). This mission is still in the study phase. Used for Magellan Mission (ESA). *1982*

magic tees
Compound waveguides or coaxial tees with four arms which exhibit directional characteristics, when properly matched, so that a signal entering one arm will be split between two of the other arms but not the third. A signal entering another arm is likewise split with half the energy entering one of the arms common to the other input but not its second arm and the other half of the energy entering the arm not used by the other input. Magic tees are used in radar as transmitter receiver duplexers. *SP-7 1968*

magma
Naturally occurring mobile rock materials, generated within the earth and capable of intrusion and extrusion, from which igneous rocks are thought to have been derived by solidification and related processes. *DOE 1968*

magnetic bearings
Any application of the principle in which something capable of rotation and translation is held by the use of electromagnetic force without touching it. Applications range from small instruments to very large forces. *1982*

magnetic compression
The force exerted by a magnetic field on an electrically conducting fluid or on a plasma. *1980*

magnetic cooling
Keeping a substance cooled to about 0.2 K by using a working substance (paramagnetic salt) in a cycle of processes between a high-temperature reservoir (liquid helium) at 1.2 K and a low temperature reservoir containing the substance to be cooled. *1980*

magnetic drums
Memory devices used in computers; rotating cylinders on which information may be stored as magnetically polarized areas, usually along several parallel tracks around the periphery. *SP-7 1969*

magnetic equator
That line on the surface of the earth connecting all points at which the magnetic dip is zero. Used for geomagnetic equator. *SP-7 1968*

magnetic field intensity
Use magnetic flux

magnetic field reconnection
A change in topology of the magnetic field configuration resulting from a localized breakdown of the requirement for 'connection' of fluid elements at one time on a common magnetic field line. Alternatively, it occurs when an electric field exists with a component parallel to a locally two-dimensional X-type magnetic neutral line which is equivalent to a breakdown in connection. *1985*

magnetic fields
Regions of space wherein magnetic dipoles would experience a magnetic force or torque; often represented as the geometric array of the imaginary magnetic lines of force that exist in relation to magnetic poles. *SP-7 1968*

magnetic flux
The magnetic force excerted on an imaginary unit magnetic pole placed at any specified point of space. It is a vector quantity. Its direction is taken as the direction toward which a north magnetic pole would tend to move under the influence of the field. If the force is measured in dynes and the unit pole is a cgs unit pole, the field intensity is given in oersteds. Used for magnetic field intensity. *SP-7 1968*

magnetic memories
Use magnetic storage

magnetic mirrors
Magnetic fields so arranged that they will theoretically confine a hot plasma. *SP-7 1968*

magnetic moments
The quantities obtained by multiplying the distances between two magnetic poles by the average strength of the poles. Measures of the magnetic flux set up by the gyration of an electric field in a magnetic field. Moments are negative, indicating they are diagramatic, and equal to the energy of rotation divided by the magnetic field. In atomic and nuclear physics, moments, measured in Bohr magnetrons, are associated with the intrinsic spin of the particle and with the orbital motion of the particle in a system. *SP-7 1968*

magnetic poles
Either of the two places on the surface of the earth where the magnetic dip is 90 deg., that in the Northern Hemisphere (at, approximately, latitude 73 deg. 8 N, longitude 101 deg. W in 1955) being designated north magnetic pole, and that in the Southern Hemisphere (at, approximately, latitude, 68 deg. S, longitude 144 deg. E in 1955) being designated south magnetic pole. Either of those two points of a magnet where the magnetic force is the greatest. In magnetic theory, a fictitious entity analogous to a unit charge of electrostatic theory. In nature only dipoles, not isolate magnetic poles exist. *SP-7 1968*

magnetic storage
In computer terminology, any device which makes use of the magnetic properties of materials for the storage of information. Used for magnetic memories. *SP-7 1968*

magnetic storms
Worldwide disturbances of the earth's magnetic field. Used for geomagnetic storms and magnetic substorms. *SP-7 1968*

magnetic substorms
Use magnetic storms

magnetic tapes
Ribbons of paper, metal, or plastic, coated or impregnated with magnetic material on which information may be stored in the form of magnetically polarized areas. *SP-7 1968*

magnetoelasticity
Use magnetostriction

magnetogasdynamics
Use magnetohydrodynamics

magnetohydrodynamic waves
Transverse waves in a magnetohydrodynamic field in which the driving force is the tension introduced by the magnetic field along the lines of force. Used for Alfven waves, hydromagnetic waves, and plasma sound waves. *SP-7 1968*

magnetohydrodynamics
The study of the interaction that exists between a magnetic field and an electrically conducting fluid. Used for geometrical hydromagnetics, hydromagnetics, hydromagnetism, and magnetogasdynamics. *SP-7 1968*

magnetoionic plasma
Use plasmas (physics)

magnetomechanics (physics)
Study of the effects which the magnetization of a material and its strain have on each other. *1979*

magnetometers
Instruments used in the study of geomagnetism for measuring a magnetic element. Used for Gaussmeters. *SP-7 1968*

magnetoplasmadynamics
The study of the dynamics of generating electricity by passing a beam of ionized gas through a magnetic field. *1980*

magnetoplasmas
Use plasmas (physics)

magnetostriction
The phenomenon wherein ferromagnetic materials experience an elastic strain when subjected to an external magnetic field. The converse in which mechanical stresses cause a change in the magnetic induction of a ferromagnetic material. Used for magnetoelasticity. *SP-7 1968*

magnetovariographs
Use variometers

magnetron sputtering
A deposition method in which a microwave tube is utilized to confine a plasma magnetically to produce high deposition rates and a low working-gas partial pressure. *1980*

magnetrons
Electron tubes characterized by the interaction of electrons with the electric field of a circuit element in crossed steady electric and magnetic fields to produce alternating current power output. *SP-7 1968*

magnets
Bodies which produce magnetic fields around themselves. *SP-7 1968*

magnification
A ratio of the size of an image to its corresponding object. This is usually determined by linear measurement. Used for magnifiers. *ASTM (E 7, E-4; E 175, E-25) 1968*

magnifiers
Use magnification

MagSat B satellite
The second in a series of satellites for measuring the earth's magnetic field. Similar magnetic measurements are proposed as part of the geopotential research mission. *1980*

MagSat satellites
A series of satellites used to study the magnetic field. *1979*

MagSat 1 satellite
A scientific satellite launched by NASA for surveying the earth's magnetic field. It was launched in October 1979 and reentered in June 1980. *1979*

malfunctions
Improper functioning of components, causing improper operation of a system. *SP-7 1968*

man machine systems
Systems in which the functions of the man and the machine are interrelated and necessary for the operation of the system. *SP-7 1968*

man powered aircraft
Aircraft powered by human energy. *1981*

man-computer interface
The interface between man and the computer and its interrelationships including ergonomic factors. Used for human-computer interface and user-computer interface. *1986*

manatees
Large plant eating aquatic mammals living in shallow tropical waters near the coasts of North and South America. *1980*

manned Mars missions
Any of several options for manned missions to Mars in which spacecraft are built for a particular mission. A mission is estimated by around 2020 and may last from one year to three years depending on speed and design. *1987*

manometers
Instruments for measuring pressure of gases and vapors above and below atmospheric pressure. Used for micromanometers and U tubes. *SP-7 1968*

mantle (earth structure)
Use earth mantle

manures
Materials that fertilize land. Refuse of stables and barnyards consisting of mammal and bird excreta with or without litter. *1981*

Mapsat
A proposed stereoscopic system for mapping the earth from space to replace Landsat D as defined by the US Geological Survey. *1982*

Marangoni convection
Convective flow induced by surface tension gradients. This is important in both ground and space processing where a free surface is present. *1982*

Marecs maritime satellites
The European Space Agency's system of two satellites provides maritime communications links between ships and coast earth stations. Originally known as Marots, the system operates with one satellite over the Atlantic Ocean and one over the Pacific Ocean. It was leased to the International Maritime Satellite Organization for five years. Also known as the maritime European communications satellite. *1982*

marine chemistry
The study of the chemical processes in oceanic environments. *1978*

Mariner Mark 2 Spacecraft
A NASA concept of a basic planetary spacecraft for studying the outer planets, comets, and asteroids. The first of the series will be a comet rendezvous mission to be launched in 1994. *1983*

Marisat satellites
A class of maritime commercial communication service satellites designed to provide telephone, telegraph, radio, distress messages and facsimile services to merchant ships, etc. *1978*

Marisat 1 satellite
The first commercial maritime communication satellite. *1978*

Maritime Communication Satellite (ESA)
Use Marots (ESA)

Maritime Orbital Test Satellite
Use Marots (ESA)

Marots (ESA)
Earlier name for the Marecs maritime satellites. Used for Maritime Communication Satellite (ESA) and Maritime Orbital Test Satellite. *1976*

Mars craters
Craters from meteoritic impact on the surfaces of Mars. *1978*

Mars volcanoes
Volcanoes on the planet Mars. *1981*

Mars 4 Spacecraft
One of a series of Soviet unmanned spacecraft designed for Mars exploration. *1976*

marshes
Use marshlands

marshlands
Transitional land-water areas, covered at least part of the time by estuarine or coastal waters and characterized by aquatic and grasslike vegetation. Used for bogs, coastal marshlands, marshes, and swamps. *DOE 1971*

martensitic transformation
A phase transformation occurring in some metals and resulting in formation of martensite. *1976*

martingales
In game theory, a procedure for recouping one's losses in previous wagers by doubling or otherwise increasing the amount bet. *1979*

mass
A quantity characteristic of a body, which relates the attraction of this body toward another body. Since the mass of a body is not fixed in magnitude, all masses are referred to the standard kilogram, which is a lump of platinum. Used for low mass. *SP-7 1968*

mass drivers (payload delivery)
Proposed method for payload delivery into earth orbit from the moon by electromagnetic acceleration; also for deliveries to Lagrange equilibrium points. *1978*

mass ratios
The ratios of the mass of the propellant charge of a rocket to the total mass of the rocket when charged with the propellant. *SP-7 1968*

mass spectrometers
Instruments that are capable of separating ionized molecules of different mass to charge ratio and measuring the respective ion currents. Used for ion spectrometers and retarding ion mass spectrometers. *ASTM (E 425, E-7) 1968*

mass to light ratios
The ratio of the mass of celestial body to its luminosity. *1981*

materials recovery
The treatment of a material to reclaim one or more of its components. *1968*

matrix management
An organized approach to administration of a program by defining and structuring all elements to form a single system with components united by interaction. *1980*

matrix materials
The ingredients used as binding agents to produce composite materials. *1980*

maximum entropy method
Procedure used in estimating high resolution power spectra from short data lengths. *1980*

maximum usable frequency
For a given distance from a transmitter, the highest frequency at which sky waves can be received. *SP-7 1968*

maypole antennas
A class of antennas which use the deployable reflector concept for large space systems applications. *1981*

MBM junctions
Diode devices using metal-barrier-metal layers. Used for metal-barrier-metal junctions. *1981*

mean free path
Of any particle, the average distance that a particle travels between successive colisions with the other particles of an ensemble. Specifically, the average distance traveled by the molecules of a perfect gas between consecutive collisions with one another. For any process the reciprocal of the cross section per unit volume for that process. *SP-7 1968*

mean square values
In statistics, values representing the average of the sum of the of the squares of the deviations from the mean value. *1980*

measurement
The technical action required to assign values (numbers) to represent certain properties or attributes, using rules based on scientific laws. Used for determination, measuring, and quantization. *ASTM (D-3040, D-11) 1968*

measuring
Use measurement

mechanoreceptors
Nerve endings that react to mechanical stimuli, as touch, tension, and acceleration. *SP-7 1968*

Meissner effect
Use superconductivity

melt spinning
A material process by which polymers such as nylon and polyesters and glass are melted to permit extrusion into fibers through spinnerets. *1980*

melts (crystal growth)
Molten substances from which crystals are formed during the cooling or solidifying process. *1977*

membrane analogy
Use membrane structures

membrane structures
Shell structures, often pressurized, that do not take wall bending or compression loads. Used for membrane analogy. *SP-7 1968*

memory (computers)
The component of a computer, control system, guidance system, instrumented satellite, or the like, designed to provide ready access to data or instructions previously recorded so as to make them bear upon an imediate problem, such as the guidance of a physical object, or the analysis and reduction of data. *SP-7 1983*

mercury cadmium tellurides
Compounds of tellurium exhibiting photovoltaic characteristics and used for photodiodes and photodetectors in the 3 to 12 micrometer wavelengths at cryogenic temperatures. Used for cadmium mercury tellurides. *1980*

mercury ion engines
Machines providing thrust by expelling accelerated or high velocity mercury ions and often using energy provided by nuclear reactors. *1977*

Mercury surface
The surface of the planet Mercury. *1987*

mesons
In the classification of subatomic particles by mass, the second lightest of such particles. Their mass is intermediate between that of the lepton and the nucleon. *SP-7 1968*

mesopause
The base of the inversion at the top of the mesosphere, usually found at 80 to 85 kilometers. *SP-7 1968*

mesoscale phenomena
Meteorological phenomena extending approximately one to a hundred kilometers (mesoscale cloud patterns, for example). *1979*

mesosphere
The atmospheric shell, in which tmperature generally decreases with heights, extending from the stratopause at about 50 to 55 kilometers to the mesopause at about 80 to 85 kilometers. *SP-7 1968*

message processing
In communication operations, the acceptance, preparation for transmission, receipt and/or delivery of a series of words or symbols intended for conveying information. *1980*

metabolites
Products of biological synthesis and/or metabolism. *1980*

metal corrosion
Use corrosion

metal foams
Foamed materials formed under low gravity conditions in space from sputtered metal deposits. This experimental space processing was completed in the second NASA SPAR flight. *1978*

metal vapor lasers
Stimulated emission devices the active materials of which are vaporized metals. *1977*

metal-barrier-metal junctions
Use MBM junctions

metal-insulator-metal diodes
Use MIM diodes

metal-nitride-oxide-semiconductors
Class of semiconductors utilizing silicon nitride and silicon oxide dielectrics. *1979*

metal-semiconductor-metal semiconductors
Use MSM (semiconductors)

metallic glasses
Amorphous alloys (glassy metals) produced by extremely rapid quenching of molten transition-metal alloys (e.g., iron, nickel, and/or cobalt). These metallic glasses exhibit unique mechanical, magnetic, and electrical properties, superconductive behavior, and anticorrosion resistance, depending on the alloys, their formation and quenching techniques. *1978*

metallicity
The abundance index of a metal or metals for a celestial body. *1983*

metamorphism (geology)
The mineralogical and structural adjustment of solid rocks to physical and chemical conditions which have been imposed at depth below the surface zones of weathering and cementation, which differ from the conditions under which the rocks in question originated. *DOE 1968*

meteor bursts
Use meteoroid showers

meteor trails
Anything, such as light or ionization, left along the trajectory of the meteor after the head of the meteor has passed. Used for meteoritic ionization. *SP-7 1968*

meteorite compression tests
Use meteorites

meteorites
Meteoroids which have reached the surface of the earth without being completely vaporized. Used for meteorite compression tests. *SP-7 1968*

meteoritic ionization
Use meteor trails

meteoroid showers
Groups of meteoroids with approximately parallel trajectories. Used for meteor bursts. *SP-7 1968*

Meteoroid Technology Satellite
Use Explorer 46 satellite

meteoroids
Solid objects moving in interplanetary space, of a size considerably smaller that asteroids and considerably larger than atoms or molecules. Used for meteors. *SP-7 1968*

meteorological rockets
Use sounding rockets

meteorology
The study dealing with the phenomena of the atmosphere. This includes not only the physics, chemistry, and dynamics of the atmosphere, but is extended to include many of the direct effects of the atmosphere upon the earth's surface, the oceans, and life in general. A distinction can be drawn between meteorology and climatology, the latter being primarily concerned with average not actual weather conditions. Used for atmospheric conditions. *SP-7 1968*

meteors
Use meteoroids

methanation
The conversion of various organic compounds to produce methane. *1980*

method of moments
A method of estimating the parameters of a distribution by relating the parameters to moments. *1981*

metric conversion
Use metrication

metric photography
The recording of events by means of photography (either singly or sequentially), together with appropriate metric coordinates to form the basis for accurate measurements. *SP-7 1971*

metric system
Use International System of Units

metrication
The conversion on an industry and/or nationwide basis of English units of measurement into the International System of Units, including engineering and manufacturing standards, tools and instruments, and all affected areas in the government and private sectors. Used for metric conversion. *1977*

metrology
The science of dimensional measurement; sometimes includes the science of weighing. *SP-7 1968*

microballoons
Very small glass spheres (50 to 100 micrometers in diameter) used as targets in the laser fusion programs. *1980*

microcalorimeters
Use calorimeters

microchannel plates
An array of microchannels formed into plates and contained in a photomultiplier tube. Used for multichannel plates. *1980*

microcomputers
Complete digital computers utilizing a microprocessor consisting of one or more integrated circuit chips as the central arithmetic and logic unit, and added chips to provide timing, program memory, random access memory interfaces for input and output signals and other functions. Some microcomputers consist of a single integrated-circuit chip. *1978*

microdensitometers
Image analysis devices for resolving gray-level differences within or between features and for integrating the optical density across scanned images of irregularly shaped objects.
ASTM (D 3849, D-24) 1968

microgravity
Use reduced gravity

micromanometers
Use manometers

micromechanics
The study of the constraints, the grain size, and their interrelationship in materials. *1984*

micrometeorites
Very small meteorites or meteoritic particles with a diameter in general less than a millimeter. *SP-7 1972*

micrometers
Instruments for making precise linear measurements in which the displacements measured correspond to the travel of a screw of accurately known pitch. *SP-7 1968*

microphones
Electroacoustic transducers which receive acoustic signals and deliver corresponding electric signals. *SP-7 1968*

microphotometers
Use photometers

microscopes
Optical instruments capable of producing a magnified image of a small object. *ASTM (E 175, E-25) 1968*

microscopy
The science of the interpretive use and applications of microscopes. *ASTM (E 175, E-25) 1968*

microwave radiation
Use microwaves

microwave scanning beam landing system
Primary position sensor of Space Shuttle Orbiter's navigation system during the autoland phase of the flight. Used for MSBLS.
1977

microwaves
Of, or pertaining to, radiation in the microwave region. Used for microwave radiation. *SP-7 1968*

microyield strength
Stress at which a microstructure (single crystal, for example) exhibits a specified deviation in its stress-strain relationship. *1977*

midaltitude
The average of many measurements of altitudes as with satellite instruments for the compiling of planetary maps. *1980*

middle atmosphere
The portion of the earth atmosphere extending from the troposphere to 100 kilometers. *1980*

Mie scattering
Any scattering produced by spherical particles withouut special regard to comparative size of radiation wavelength and particle diameter. Used for MIE theory. *SP-7 1968*

MIE theory
Use Mie scattering

MiG aircraft
Any of a series of Soviet fighter aircraft, fighter-bombers, interceptors, and air supremacy aircraft, designed by Mikoyan.
1977

Milky Way Galaxy
The galaxy to which the sun belongs. *SP-7 1968*

MIM diodes
Junction diodes each consisting of an insulating layer sandwiched between two metallic surface layers and exhibiting a negative differential resistance in its V-1 characteristics conceivably because of stimulated inelastic tunneling of electrons. Used for metal-insulator-metal diodes. *1980*

Mimas
A satellite of Saturn orbiting at a mean distance of 186,000 kilometers. *SP-7 1969*

MIMD (computers)
A type of parallel processor that is essentially two or more individual computers with facilities for interaction and work sharing. Used for multiple instruction multiple data stream. *1987*

minimal surfaces
Surfaces for which the first variation of the area integral vanish.
1982

minimum entropy method
Application of entropy in statistical mechanics. *1980*

minitrack optical tracking system
Use minitrack system

minitrack system
A satellite tracking system consisting of a field of separate antennas and associated receiving equipment interconnected so as to form interferometers which track a transmitting beacon in the payload itself. Used for minitrack optical tracking system and MOTS (tracking system). *SP-7 1968*

Minor Planet 1221
Use Amor asteroid

Minor Planet 2060
Use Chiron

Mir space station
The Soviet space station launched February 20,1986; its name means peace or world in Russian. It is a manned, modular, permanent, and multi-mission station. *1987*

Mira variables
Long-period (80 to over 600 days) variable stars of red giant or red supergiant type, exemplified by the star Mira Ceti. Used for long period variables. *1987*

Mirage aircraft
Collective term for a class of French attack aircraft. *1980*

Miranda
A satellite of Uranus orbiting at a mean distance of 124,000 kilometers. *SP-7 1973*

Miranda satellite
This United Kingdom satellite was launched in 1974 into a sun synchronous, low earth orbit. Prime objective of the mission was to experiment with satellite attitude control. It ceased to operate the same year it was launched. *1979*

mirror fusion
An open-ended configuration which traps low beta plasmas. It is realized by associating two identical magnetic mirrors having the same axis. *1981*

mismatch (electrical)
Condition in which the impedance of a source does not match or equal the impedance of the connected load or transmission line. *1976*

missiles
Any objects thrown, dropped, fired, launched, or otherwise projected with the purpose of striking a target. *SP-7 1968*

missing mass (astrophysics)
A problem related to a cluster of galaxies in which the mass derived from the dynamical stability of its member galaxies, the dynamical mass, is substantially larger than the mass estimated by the mass-to-luminosity ratio of the visible parts of the galaxies, the visible mass. *1985*

mist
Liquid, usually water in the form or particles suspended in the atmosphere at or near the surface of the earth; small water droplets floating or falling, approaching the form of rain, and sometimes distinguished from fog as being more transparent or as having particles perceptibly moving downward. *ASTM (D 1356, D-22) 1968*

MIUS
Use modular integrated utility system

mixed oxides
Mixture of oxides, particularly of radioactive metals. *1980*

mixing depth
Use mixing height

mixing height
The heights of the layer through which the atmosphere is well mixed. The height will vary with diurnal, seasonal, and regional variations. Used for mixing depth. *1983*

MLA
Use multispectral linear arrays

MMS
Use multimission modular spacecraft

mobile communication systems
Any configuration of mobile or transportable voice and data communication equipment which allows for communication between combinations of mobile/fixed points with or without the aid of satellites. *1982*

mode coupling
Use coupled modes

mode of vibration
Use vibration mode

model reference adaptive control
This deals with three parameters: an ideal adaptive control system whose response is agreed to be optimum; computer simulation in which both the model system and the actual system are subjected to the same stimulus; and parameters of the actual system which are adjusted to minimize the difference in the outputs of the model and the actual system. Used for MRAC (systems). *1986*

moderators
Materials that have a high cross section for slowing down fast neutrons with a minimum of absorption, e.g., heavy water, beryllium, used in reactor cores. *SP-7 1968*

MODFETS
Heterojunction field effect transistor device structures in which only the larger (Al, Ga)As bandgap is doped with donors while the GaAS layer is left undoped. This results in high electron mobilities due to spatially separated electrons and donors. Used for modulation doped FETs. *1987*

modular integrated utility system
A joint NASA-HUD concept incorporating various utilities -- electric power plant, water supply, heating and air conditioning, sewage treatment, and waste disposal into a single system having increased efficiency and economy. Use for MIUS. *1976*

modulation
The variation in the value of some parameter characterizing a periodic oscillation. Specifically, variation of some characteristic of a radio wave, called the carrier wave, in accordance with instantaneous values of another wave, called the modulating wave. Used for carrier modulation. *SP-7 1968*

modulation doped fets
Use MODFETS

modulation doping
The process of doping only the larger bandgap of a heterojunction device with donors, while the other layer is left undoped. Since the electrons and donors are spatially separated, ionized impurity scattering is avoided and extremely high electron mobilities are obtained. *1987*

modulators
Devices to effect the process of modulation. *SP-7 1968*

modulus of elasticity
The ratio of stress (nominal) to corresponding strain below the proportional limit of a material. It is expressed in force per unit area. Used for compliance (elasticity), elastic modulus, and Young modulus. *ASTM (D 695, D-20) 1968*

Moire fringes
The bands which appear in the Moire effect. *1981*

Moire interferometry
The use of intersecting families of curves as instruments for making precise measurement, the study of indices of refractions, etc. by utilizing the interference patterns. *1980*

molecular beam epitaxy
Ultrahigh vacuum technique for growing very thin epitaxial layers of semiconductor crystals. *1980*

molecular clouds
Thickest and densest interstellar clouds consisting mainly of molecular hydrogen but also a high concentration of dust grains. *1980*

molecular dissociation
Use dissociation

molecular flow
The flow of gas through a duct under conditions such that the mean free path is greater than the largest dimension of a transverse section of the duct. *SP-7 1968*

molecular shields
Furlable devices used in space vacuum research to permit deployment and retrieval of instruments and the performance of experiments without contamination. *1979*

molecular weight
The weight of a given molecule expressed in atomic weight units. *SP-7 1968*

molecules
Aggragates of two or more atoms of a substance that exists as a unit. Used for macromolecules. *SP-7 1968*

Moliere formula
Use secondary cosmic rays

molten salts
High temperature inorganic salt or mixtures of salts used for thermal energy storage, heat exchangers, high power electric batteries, heat treatment of alloys, etc. *1978*

momentum
Quantity of motion. *SP-7 1968*

momentum energy
Use kinetic energy

monomers
Low molecular weight substances consisting of molecules capable of reacting with like or unlike molecules to form a polymer. *ASTM (D 1566, D-11) 1968*

monotectic alloys
Metallic composite materials having a dispersed phase of solidification products distributed within a matrix. The dispersed components can be selected to provide characteristics such as superconductivity or lubricity. *1980*

month
The period of the revolution of the moon around the earth. The month is designated as sidereal, tropical, anomalistic, dracontic, or synodical, according to whether the revolution is relative to the stars, the vernal equinox, the perigee, the ascending node, of the sun. The calender month, which is a rough approximation of the synodical month. Used for lunation. *SP-7 1968*

moon
The natural satellite of the earth. *SP-7 1968*

MOS (Japanese spacecraft)
Use Japanese spacecraft

motion
The act, process or instance of change of position. Also called movement, especially when used in connection with problems involving the motion of one craft relative to another. Used for movement. *SP-7 1968*

motion equations
Use equations of motion

motion sickness
The syndrome of pallor, sweating, nausea, and vomiting which is induced by unusual acceleration. Used for air sickness. *SP-7 1968*

motion simulation
Replication of exact motion or replication of part of a motion to provide the sensation of the motion. *1982*

motor vehicles
Automotive vehicles that do not run on rails, generally having rubber tires. *1976*

motors
Machines supplied with external energy which is converted into force and/or motion. *1968*

MOTS (tracking system)
Use minitrack system

movement
Use motion

moving target indicators
Devices which limit the display of radar information primarily to moving targets. Used for MTI radar. *SP-7 1968*

MRAC (systems)
Use model reference adaptive control

MSAT
A joint Canada United States mobile satellite system which is being developed with a voice and data communication link between mobile units and the switched telephone network or between mobile units and other mobile units via a satellite. Each country will have a satellite capable of mutual backup. Launch date is planned for the early 1990's. *1981*

MSBLS
Use microwave scanning beam landing system

MSM (semiconductors)
Semiconductor devices consisting of a semiconductor layer sandwiched between two layers of metal. Used for metal-semiconductor-metal semiconductors. *1986*

MTI radar
Use moving target indicators

multi-anode microchannel arrays
A family of photoelectric, photon counting array detectors being developed for use in instruments on both ground based and spaceborne telescopes. *1982*

multibeam antennas
Antennas that have the ability to form more than one beam from a single radiating aperture. *1982*

multichannel plates
Use microchannel plates

multilayer structures
Use laminates

multimission modular spacecraft
Future spacecraft to be operated in conjunction with the Space Shuttle orbiter vehicle and serviced by its module exchange mechanism. Used for MMS. *1977*

multipath transmission
The process, or condition, in which radiation travels between source and receiver via more than one path. Since there can be only one direct path, some process of reflection, refraction or scattering must be involved. *SP-7 1968*

multiphoton absorption
Ionization and dissociation of a molecule under the action of powerful laser radiation. Laser-flux dependent light intensities are emitted by different excited states of the molecule indicate the various absorption processes. *1980*

multiple access
The allocation of communication system resources (output) among multiple users by means of power, bandwidth, and power assignment singly or in combination. *1979*

multiple instruction multiple data stream
Use MIMD (computers)

multiplex transmission
Use multiplexing

multiplexers
Use multiplexing

multiplexing
The simultaneous transmission of two or more signals within a single channel. The three basic methods of multiplexing involve the separation of signals by time division, frequency division, and phase division. Used for multiplex transmission and multiplexers. *SP-7 1968*

multiplier phototubes
Use photomultiplier tubes

multipliers
Devices which have two or more inputs and whose output is a representation of the product of the quantities represented by the input signals. *SP-7 1968*

multipropellants
Use rocket propellants

multiradar tracking
Use radar networks

multispectral linear arrays
Large number of interconnected solid state detectors in a pushbroom mode wherein the forward motion of the vehicle (spacecraft) sweeps the assembly of detectors which are oriented perpendicular to the ground track. Used for MLA. *1980*

multispectral resource sampler
An experimental remote sensing instrument for satellites to measure both intensity and polarization at several wavelengths. The first one is to be launched in the late 1980's. *1981*

multistage rocket vehicles
Vehicles having two or more rocket units, each unit firing after the one in back of it has exhausted its propellant. Normally, each unit, or stage, is jettisoned after completing its firing. *SP-7 1968*

multistatic radar
System in which successive lobes of the antenna are sequentially engaged to provide a tracking capability without physical movement of the antenna. Used for bistatic radar. *1979*

multitemporal analysis
Use temporal resolution

multivibrators
Two-stage regenerative circuits with two possible states and an abrupt transition characteristic. *SP-7 1968*

muon spin rotation
Particle spin depolarization caused by sensitivity of muon spin to the presence of defects in certain metals. *1981*

muscovite
An important mineral of the mica group. *DOE 1968*

mushy zones
Regions of liquid plus solid phases in alloys that solidify over a range of temperatures. Used for liquid plus solid zones. *1983*

mutagens
Agents that raise the frequency of mutations above the spontaneous rate. *1981*

MX missile
United States strategic intercontinental ballistic missile. *1979*

Mystere 50 aircraft
A tri-engine business jet aircraft (Dassault). Used for Dassault Mystere 50 aircraft. *1980*

N

naked singularities
Singularities in spacetime that will be visible and communicable to the outside world, i.e., singularities that are not shielded by an event horizon from infinity. *1981*

nap-of-the-earth navigation
Low altitude flight of helicopters during night or day utilizing electronic means for detection and recognition of landmarks and targets. Used for NOE navigation. *1980*

narrowband
A description of frequency measurement whose frequency band of energy is smaller relative to the rest of the band. *1984*

National Oceanic Satellite System
Joint NASA (Goddard)-DOD venture. *1980*

National Operational Environmental Sat Sys
Use NOESS

national parks
Areas of scenic beauty or historical importance preserved and maintained by the national government for the enjoyment of the public. *1980*

natural frequencies
Use resonant frequencies

natural gas exploration
Searching the geological features to identify locations for stimulating wells for recovery of natural gas. *1980*

natural language (computers)
A computer language whose rules reflect and describe current rather than prescribed usage. The language is often loose and ambiguous in intrepretation. *1977*

natural lasers
Use lasers

nausea
A feeling of discomfort in the region of the stomach, with aversion to food and a tendancy to vomit. *SP-7 1968*

nautical charts
Charts and maps of oceans, coasts and harbors now compiled from satellite data for precision and correction of local errors. *1980*

Navier-Stokes equation
The equation of motion for a viscous fluid. *SP-7 1968*

navigation
The practice or art of directing the movement of a craft from one point to another. Navigation usually implies the presence of a human, a navigator, aboard the craft. *SP-7 1968*

navigation technology satellites
Class of navigation satellites utilizing the global positioning system as well as a precise frequency and timing system. Used for NTS. *1979*

negative feedback
Feedback which results in decreasing the amplification. Used for degenerative feedback. *SP-7 1968*

negative ions
Ions singly or in groups which acquire negative charges by gaining one or more electrons. *1978*

negatrons
Negative electrons. Sometimes shortened to negatons. *SP-7 1968*

nephelometers
General name for instruments which measure, at more than one angle, the scattering function of particles suspended in a medium. Instruments for chemical analysis by measuring the light scattering properties of a suspension. *SP-7 1968*

Neptune atmosphere
The atmosphere of the planet Neptune which is primarily composed of hydrogen and methane. *1979*

network control
The management of acquisition, routing, and switching primarily in satellite communication. *1981*

neurology
The study of the anatomy, physiology, and pathology of the nervous system. Used for neuroscience. *SP-7 1968*

neuroscience
Use neurology

neurotransmitters
Chemical substances secreted by the terminal ends of axons, which stimulate a muscle fiber contraction or an impulse in other neurons. *1980*

neutral atoms
Atoms in which the number of electrons surrounding the nucleus equals the number of protons in the nucleus resulting in no net electric charge. *1979*

neutral currents
Weak interaction currents that carry zero electric charge. *1981*

neutral gases
In astronomy, gas clouds of some nebulae which have not been ionized by hot stars. *1977*

neutrino beams
Organized collections of neutrinos traveling outward from the source. *1981*

neutrinos
Sub atomic particles of zero, or near zero, rest mass, having no electric charge, postulated by Fermi (1934) in order to explain apparent contradictions to the the law of conservation of energy in beta particle emission. *SP-7 1968*

neutron flux
Use flux (rate)

neutron flux density
A measure of the intensity of neutron radiation within a given range of neutron energies; the product of the neutron density and velocity, measured in neutrons per square meter-second or neutrons per square centimeter-second. *ASTM (E 185, E-10) 1968*

neutron radiography
Nondestructive testing and inspection utilizing neutron beams from nuclear reactors, particle accelerators, and/or radioisotopes. Imagery displaying structural defects utilizes neutron image recorders or screens. *1979*

neutrons
Subatomic particles with no electric charge, and with a mass of 1.67482 times 10 to the minus 24 gram. *SP-7 1968*

newton
The unit of force in the SI system; that force which gives to a mass of 1 kilogram an acceleration of 1 meter per second squared. *SP-7 1969*

nickel iron batteries
Alkaline-type electric cells using potassium hydroxide as the electrolyte and anodes of steel wool substrate with active iron material and cathodes of nickel plated steel wool substrate with active nickel material. *1980*

nickel steels
Steels containing nickel as a main alloying element. *DOE 1968*

Nimbus 7 satellite
One in a series of meteorological satellites. *1980*

nitinol alloys
Shape memory alloys of titanium and nickel. *DOE 1972*

nitrogen lasers
Stimulated emission devices in which the nitrogen molecule is the lasing medium. *1979*

NOAA 4 satellite
One of a series of meteorological satellites launched by NASA for the National Oceanic and Atmospheric Administration. *1976*

NOAA 5 satellite
One of a series of environmental satellites launched by NASA for the National Oceanic and Atmospheric Administration for the sensing and recording of atmospheric, hydrological, and oceanographic environmental data. *1978*

NOAA 6 satellite
Designation for a NOAA meteorological satellite conforming to the TIROS N configuration. *1980*

NOAA 7 satellite
Designation for the seventh NOAA meteorological satellite conforming to the TIROS N configuration. *1981*

noble gases
Use rare gases

noctilucence
Use luminescence

noctilucent clouds
Clouds of unknown composition which occur at great heights, 75 to 90 kilometers. They resemble thin cirrus clouds, but usually with a bluish or silverish color, although sometimes orange to red, standing out against a dark night sky. Sometimes called luminous clouds. *SP-7 1968*

nodes (standing waves)
Points, lines, or surfaces in standing waves where some characteristic of the wave field has essentially zero amplitude. *SP-7 1968*

NOE navigation
Use nap-of-the-earth navigation

NOESS
The acronym for the National Operational Environmental Satellite System. This term is no longer in use. Used for National Operational Environmental Sat Sys. *1980*

noise pollution
Objectional or harmful levels of noise. *DOE 1971*

noise prediction
Estimation of intensity and frequencies based on analyses of probable oscillation of vibration producing components. *1980*

noise prediction (aircraft)
Estimating or forecasting of aircraft noise. Used for aircraft noise prediction. *1979*

nomograms
Use nomographs

nomographs
On charts or graphs, lines of constant value of given quantities with respect to either space or time. Used for isopleths and nomograms. *SP-7 1968*

nonadiabatic conditions
In thermodynamics, changes in volume, temperature, flow, etc. accompanied by a transfer of heat. *1976*

nonadiabatic processes
Use heat transfer

nonisothermal processes
In thermodynamics, compression or expansion of substances at nonuniform temperatures. *1976*

nonisotropy
Use anisotropy

nonlinear optics
Study of the interaction of radiation with matter in which certain variables describing the response of the matter are not proportional to variables describing the radiation. *DOE 1972*

nonNewtonian flow
The rate of flow of a material that is not proportional to the degree of force applied. *ASTM (D 2849, D-20) 1968*

nonNewtonian fluids
Fluids that exhibit a viscosity which varies with changing shear stress or shear rate. *ASTM (D 3829, D-2) 1968*

nonpoint sources
Undetermined or general areas from which pollutants, contaminants, and/or other unwanted materials or wastes enter the environment. *1980*

nonrigidity
Use flexibility

noon
The instant at which a time reference is over the upper branch of the reference meridian. *SP-7 1968*

North Polar Spur (astronomy)
One of the largest sources of diffuse radio emission outside the galactic plane. The Spur, a ridge of enhanced emission, may be the remnant of the shells of supernovae which exploded over 100,000 years ago. *1978*

northern sky
That part of the sky visible from the northern hemisphere. *1981*

nose caps
Use nose cones

nose cones
The cone shaped leading ends of rocket vehicles, consisting (a) of chambers in which satellites, instruments, animals, plants, or auxillary equipment may be carried, and (b) of outer surfaces built to withstand high temperatures generated by aerodynamic heating. Used for nose caps. *SP-7 1968*

nose tips
The foremost, sharp points of bombs, rockets, missiles, and other symmetrical bodies. *1979*

Nova computers
A series of minicomputers built by Data General. *1984*

Nova Laser System
Laser fusion system utilizing large neodymium glass lasers for irradiating DT pellets. *1980*

Nova satellites
A second generation Navy navigation satellite which replaces the transit satellites. *1981*

nowcasting
A self contained short period meteorological forecast for the immediate future covering a period of up to six hours. *1982*

nozzle efficiency
The efficiency with which a nozzle converts potential energy into kinetic energy, commonly expressed as the ratio of the actual change in kinetic energy to the ideal change at the given pressure ratio. *SP-7 1968*

NTS
Use navigation technology satellites

nuclear devices
Devices whose explosive potency is derived from nuclear fission of atoms of fissionable material with the consequent conversion of part of their mass into energy. *1977*

nuclear emulsions
Very thick photographic emulsions used in the study of cosmic rays and other energetic particles. The paths of the particles through the thick emulsions are recorded in three dimensions. *SP-7 1968*

nuclear fuel reprocessing
Periodic chemical, physical, and metallurgical treatment of materials used as fuel elements in nuclear reactors to recover and purify residual fissionable and fertile materials. *1977*

nuclear fuels
Fissionable materials of reasonable long life, used or usable in producing energy in a nuclear reactor. Used for reactor fuels. *SP-7 1968*

nuclear medicine
That branch of medicine dealing with the effect of radiation such as x rays, gamma rays, and energetic particles on the body and with the prevention and cure of physiological injuries resulting from such radiation. Used for radiation medicine. *SP-7 1968*

nuclear pumped lasers
Lasers in which the excitation is supplied by a nuclear reactor as a high flux source or by the kinetic energy of the fission fragments only. *1977*

nuclear pumping
Laser-like pumping produced by electrons generated in nuclear reactions or, in general, by beams of charged particles. *DOE 1976*

nuclear radiation
Corpuscular emissions, such as alpha and beta particles, or electromagnetic radiation, such as gamma rays, originating in the nucleus of the atom. *SP-7 1968*

nuclear reactors
Apparatus in which nuclear fission may be sustained in a self supporting chain reaction. *SP-7 1968*

nuclear rocket engines
Rocket engines in which nuclear reactors are used as power sources or as sources of thermal energy. Used for thermionic reactors. *SP-7 1968*

nuclear vulnerability
The resistance of structures or materials to nuclear radiation or explosions. *1977*

nuclei (nuclear physics)
The positively charged cores of atoms with which are associated practically the whole mass of each atom but only a minute part of its volume. *SP-7 1968*

nucleons
In the classification of subatomic particles according to mass, the second heaviest type of particles; their mass is intermediate between that of the meson and the hyperon. *SP-7 1968*

nuclides
Individual atoms of a given atomic number Z and mass number A. *SP-7 1968*

numerical analysis
Study of approximation methods using arithmetic techniques. *DOE 1968*

numerical differentiation
Approximate estimation of a derivative of a function by numerical techniques. *1980*

Nusselt number
A number expressing the ratio of convective to conductive heat transfer between a solid boundary and a moving fluid, defined as hl/k where h is the heat transfer coefficient, l is the characteristic length, and k is the thermal conductivity of the fluid. (Named after Wilhelm Nusselt, German engineer). *SP-7 1968*

nutation
The oscillation of the axis of any rotating body, as a gyroscope rotor. Specifically, in astronomy, irregularities in the in the precessional motion of the equinoxes because of varying positions of the moon and, to a lesser extent, of other celestial bodies with respect to the ecliptic. Used for nutational oscillation. *SP-7 1968*

nutational oscillation
Use nutation

nystagmus
An involuntary oscillation of the eyeballs, especially occuring as a result of eye fixations and stimulations of the inner ear during rotation of the body. *SP-7 1968*

O

Oberon
A satellite of Uranus orbiting at a mean distance of 587,000 kilometers. *SP-7 1986*

oblate spheroids
Ellipsoids of revolution, the shorter axis of which is the axis of revolution. *SP-7 1968*

oblique coordinates
Magnitudes defining a point relative to two intersecting nonperpendicular lines, called axes. *SP-7 1968*

obliqueness
The state of being neither perpendicular nor horizontal. *1980*

obscuration
Use occultation

observability (systems)
The property of a system for which observations of the output variables always is sufficient to determine the initial values of all state variables. *1980*

obstacle avoidance
The use of sensors utilizing laser triangulation as means of preventing collisions, especially in the operation of roving vehicles on planetary surfaces. *1980*

obstacles
Use barriers

occlusion
Specifically, the trapping of undisolved gas in a solid during solidification. *SP-7 1968*

occultation
The disappearance of a body behind another body of larger apparent size. Used for obscuration. *SP-7 1968*

ocean color scanner
A multispectral scanning radiometer which is geared to observe ocean features such as chlorophyll, sediments, and topography in the invisible and thermal ranges of radiation. *1981*

ocean dynamics
The study of the controlling forces in different ocean phenomena. *1982*

ocean temperature
Surface or subsurface temperature of an entire or specific region of an ocean. *1980*

octaves
The intervals between two frequencies having the ratio 1:2. *SP-7 1968*

off-on control
Flicker control, especially as applied to rockets. Used for bang-bang control. *SP-7 1968*

offgassing
The relative high mass loss characteristic of many nonmetallic materials upon initial vacuum exposure. *1981*

Office of Space & Terrestr Applic Payloads
Use OSTA-1 payload
OSTA-3 payload

OFT
Use space transportation system flights

ogives
Bodies of revolution formed by rotating a circular arc about an axis that intersects the arc; the shape of these bodies; also noses of projectiles or the like so shaped. *SP-7 1968*

oil fields
Surface boundary of an area from which petroleum is obtained; may correspond to an oil pool or may be circumscribed by political or legal limits. *DOE 1972*

on-line systems
Systems where the input data enters the computer directly from the point of origin and/or in which output data is transmitted directly to where it is used. *1981*

onboard data processing
Processing of acquired data aboard an aircraft, satellite, etc. rather than transmission to ground stations for processing. *1980*

onisotropy
Use anisotropy

Oort cloud
A region of millions of comets between 30,000 and 100,000 A.U. from the sun. Comets are perturbed out of the Oort cloud by passing stars and fall into the inner solar system. The Oort cloud was named after the Dutch astronomer, Jan Hendrik Oort. *1987*

opacity
Of an optical path, the reciprocal of transmission. *SP-7 1968*

open circuit voltage
The steady state or equilibrium potential of an electrode in absence of external current flow to or from the electrode. *1981*

OPEN Project
A former NASA project now absorbed by the International Solar Terrestrial Physics Project. It proposed a simultaneous study of plasmas in the earth's magnetosphere and neighborhood using the following four instrumented spacecraft; interplanetary physics laboratory (IPL), geomagnetic tail laboratory (GTL), polar plasma laboratory (PPL), and equatorial magnetosphere laboratory (EML). Used for Origin of Plasmas in Earth Neighborhood. *1982*

operating costs
The price for operating a system exclusive of the cost of the system itself. *1981*

operating systems (computers)
Computer programs for expediting, controlling and/or recording computer use by other programs. Used for executive systems (computers). *1969*

Ophiuchi clouds
Dense concentrations of interstellar gas near the stars Rho Ophiuchi and Zeta Ophiuchi. *1982*

optical activity
Ability to rotate the plane of vibration of polarized light to the right or left. *DOE 1972*

optical bistability
A property of certain materials in which a nonlinear response is exhibited when under the influence of an external driving coherent light, thereby allowing these materials to behave like optical switches. *1983*

optical computers
Computers which use light rather than electricity for all or part of their operation. They perform multiple tasks in parallel as opposed to electronic computers which would perform those tasks sequentially. Such increased processing capability makes them suited for aerospace problems which involve systems that have a large number of degrees of freedom, i.e., large space structures, pattern recognition activity, and robotics. *1983*

optical countermeasures
Equipment for exploiting the vulnerability of laser guided weapon systems. *1978*

optical depth
Use optical thickness

optical masers
Use lasers

optical paths
Lines of sight or the paths followed by rays of light through optical systems. *SP-7 1968*

optical pyrometers
Devices for measuring the temperature of an incandescent radiating body by comparing its brightness for a selected wavelength interval within the visible spectrum with that of a standard source; a *monochromatic radiation pyrometer.* *SP-7 1968*

optical relay systems
Systems using photocouplers in which the output device is a light sensitive switch that provides the same on and off operations as the contacts of a relay. *1981*

optical scanners
A light source and phototube combined as a single unit for scanning moving strips of paper or other materials in photoelectric side-register control systems. *DOE 1968*

optical slant range
The horizontal distance in a homogeneous atmosphere for which the attenuation is the same as that actually encountered along the true oblique path. *SP-7 1968*

optical spectrum
Use light (visible radiation)

optical thickness
Specifically, in calculations of the transfer of radiant energy, the mass of a given absorbing or emitting material lying in a vertical column of unit cross sectional area and extending between two specific levels. Also called optical depth. Used for optical depth. *SP-7 1968*

optogalvanic spectroscopy
A method of obtaining absorption spectra of atomic and molecular species in flames and electrical discharges by measuring voltage and current changes upon laser irradiation. *1981*

orbit spectrum utilization
Telecommunication techniques in spectrum conservation for reducing user costs. *1980*

orbit transfer vehicles
Concept of propulsive (velocity producing) rockets or stages for use with crew transfer modules, manned sortie modules, or other payloads. Used for OTV. *1977*

orbital elements
A set of seven parameters defining the orbit of a body attracted by a central, inverse square force. *SP-7 1968*

orbital flight tests (shuttle)
Use space transportation system flights

orbital lifetime
The predicted lifetime of a satellite in orbit,usually based on such criteria as solar flux density, atmospheric density, the lessening of the eccentricity of elliptical orbits, or the gravitational effects of the sun or the moon. *1980*

orbital motion
Use orbits

orbital resonances (celestial mechanics)
Systems of two or more satellites (including planets) that orbit the same primary and whose orbital mean motions are in a ratio of small whole numbers. *1987*

orbital servicing
The replenishing of propellants, pressurants, coolants, and the replacement of modules and experiments, during some phase of a spacecraft flight to extend the mission and lifetime, or change the payloads. *1980*

orbital simulators
Use space simulators

orbital transfer
Use transfer orbits

orbital velocity
The average velocity at which an earth satellite or other orbiting body travel around its primary. The velocity of such a body at any given point in its orbit, as in 'its orbital velocity at the apogee is less than at the perigee. *SP-7 1968*

orbits
The paths of bodies or particles under the influence of a gravitational or other force. Used for orbital motion and periodic orbits. *SP-7 1968*

organic charge transfer salts
Organic compounds exhibiting temperture-dependent electrical, magnetic, and heat transfer properties. *1977*

organic peroxides
Organic compounds containing radical groups combined with oxides in which two atoms of oxygen are linked together, e.g., diethyl peroxide. *1977*

organic solids
Solid materials composed of organic materials. *1981*

Origin of Plasmas in Earth Neighborhood
Use OPEN Project

Orion (radio interferometry network)
An operational radio interferometry observational network. *1980*

Orion nebula
An H 11 region about 500 pc distant and barely visible to the naked eye in the center of Orion's sword. *1979*

oscillations
Fluctuations or vibrations on each side of a mean value or position. One oscillation is half an oscillatory cycle, consisting of a fluctuation or vibration in one direction; half a vibration. The variation, usually with time, of the magnitude of a quantity with respect to a specified reference when the magnitude is alternately greater and smaller than the reference. Used for phugoid oscillations. *SP-7 1968*

oscillator strengths
A quantum mechanical analog of the number of dispersion electrons having a given natural frequency in an atom, used in an equation for the absorption coefficient of a spectral line. *1983*

oscillators
Nonrotating devices for producing alternating current. Used for phugoid oscillations and wave oscillators. *SP-7 1968*

oscilloscopes
Instruments for producing visual representations of oscillations or changes in an electric current. *SP-7 1968*

OSO-J
Use OSO-8

OSO-8
One of a series of NASA orbiting solar observatories developed mainly for solar research. Used for OSO-J. *1976*

OSS-1 payload
Experiment package flown aboard the Space Shuttle STS-3 in 1982 which was sponsored by the NASA Office of Space Sciences from which the acronym is derived. *1979*

OSTA-1 payload
Spaceborne experiments flown aboard the Space Shuttle STS-2 in 1981 which was sponsored by the NASA Office of Space & Terrestrial Applications from which the acronym is derived. Used for Office of Space & Terrestr Applic Payloads. *1979*

OSTA-3 payload
Spaceborne systems flown aboard the Space Shuttle STS-17, sponsored by the NASA Office of Space & Terrestrial Applications from which the acronym is derived. The systems included the feature identification and location experiment-1 (FILE-1), the measurement of atmospheric pollution from satellite (MAPS), the the imaging camera-B, and the large format camera/attitude reference system (LFC/ARS). Used for Office of Space & Terrestr Applic Payloads. *1986*

otolith organs
Structures of the inner ear (utricle and saccule) which respond to linear acceleration and tilting. *SP-7 1968*

OTV
Use orbit transfer vehicles

outgassing
The evolution of gas from a material in a vacuum. *SP-7 1968*

outliers (statistics)
In sets of data values so far removed from other values in the distribution that their presence cannot be attributed to the random combination of change causes. *1981*

output
The yield or product of an activity furnished by man, machine, or system. Used for dummy loads. *SP-7 1968*

Overhauser effect
In atomic physics, a radio frequency field applied to a substance in an external magnetic field, whose nuclei have spin 1/2 and which has unpaired electrons at the electron spin resonance frequency This results in polarization of the nuclei as great as if the nuclei had the much larger electron magnetic moment. *1978*

overtones
Use harmonics

oxazole
Compounds that contain a five-membered heterocyclic ring containing one nitrogen and one oxygen atom. *DOE 1968*

oxidation
A reaction in which electrons are removed from a reactant. Sometimes, more specifically the combination of a reactant with oxygen. *ASTM (B 374, B-8) 1968*

oxidation-reduction reactions
An oxidizing chemical change, where an element's positive valence is increased (electron loss), accompanied by a simultaneous reduction of an associated element (electron gain). *1976*

oxidizers
Specifically, substances (not necessarily containing oxygen) that support the combustion of a fuel or propellant. *SP-7 1968*

oxygen deficiency
Use hypoxia

oxygen toxicity
Use hyperoxia

oxygen 17
An isotope of oxygen. *1977*

oxynitrides
Base for a broad field of nitrogen ceramics utilizing silicon, aluminum, and other elements to produce high temperature refractory materials. *1979*

ozone
A very active form of oxygen that may be produced by the corona, arcing, or ultra-violet rays.
ASTM (F 478, F 479, F 496, D 178, D1048, D1051, D 120; F-18) 1968

ozone layer
Use ozonosphere

ozonosphere
The general stratum of the upper atmosphere in which there is an appreciable ozone concentration and in which ozone plays an important part in the radiation balance of the atmosphere. This region lies roughly between 10 and 50 kilometers, with maximum ozone concentration at about 20 to 25 kilometers. Used for ozone layer. *SP-7 1968*

P

PACE
Use physics and chemistry experiment in space

packages
Any assemblies or apparatus, complete in themselves or practically so, identifiable as units and readily available for use or installation. *SP-7 1968*

packet switching
Switching circuit system for multiple access time division data transmission. *1980*

packet transmission
Transmission of bursts of digital data. *1981*

packets (communication)
Digital data messages which are almost always preceded by headers (containing address information and other control characters) and followed by control characters which signify the end of a message. *1981*

Palapa satellites
Satellites launched by the US for the Indonesian government for their domestic communications network. *1977*

paleobiology
The study of life and organisms that existed in the geologic past. *1977*

paleoclimatology
The study of climates in the geologic past, involving fossil, glacial, isotropic, or other data. *DOE 1987*

panel method (fluid dynamics)
Technique for analyzing and predicting the properties and characteristics of fluid flow; sometimes called the finite element method. *1980*

panspermia
The theory that holds that reproductive bodies of living organisms exist throughout the universe and develop wherever the environment is favorable. *1982*

PANT program
The passive nosetip technology (PANT) program is an investigation of flow phenomena over reentry vehicle nosetips by the Air Force. Used for ablative nosetips and passive nosetip technology. *1977*

paper (material)
Felted or matted sheets of cellulose fibers, formed on a fine wire screen from a dilute water suspension, and bonded together as the water is removed and the sheet is dried. *1977*

parabolas
Open curves where all points of which are equidistant from a fixed point called the focus, and a straight line. The limiting case occurs when the point is on the line, in which case the parabola becomes a straight line. *SP-7 1968*

parabolic bodies
Surfaces of revolution generated by revolving sections of parabolas about their major axis. Used for parabaloids. *SP-7 1968*

parabolic reflectors
Reflecting surfaces having the cross section along the axis in the shape of a parabola. Parallel rays striking the reflector are brought to a focus at a point, or if the source of the rays is placed at the focus, the reflected rays are parallel. Used for dishes. *SP-7 1968*

parabolic velocity
Use escape velocity

paraboloids
Use parabolic bodies

paracone
A system for recovering men and objects from great distances above the earth's surface and landing them safely onto the earth. *1982*

parallax
The difference in the apparent direction or position of an object when viewed from different points expressed as an angle. *SP-7 1968*

parallel processing (computers)
The concurrent or simultaneous execution of more than one program, or the handling of input for more than one operation at the same time. *DOE 1971*

parameter identification
The estimation of the unknown parameters of models of physical plants or processes from their dynamic response. *1980*

parameters
Use independent variables

parity
A symmetry property of a wave function. *SP-7 1968*

parsing algorithms
Computer routines for the syntactic and/or semantic analysis and restructuring of natural language instructions or data for internal processing. *1976*

partial pressure
The pressure exerted by a designated component or components of a gaseous mixture. *SP-7 1968*

particle accelerators
Specifically devices for imparting large kinetic energy to charged particles, such as electrons, protons, deuterons, and helium ions. *SP-7 1968*

particle counters
Use radiation counters

particle detectors
Use radiation counters

particle flux
Use flux (rate)

particle laden jets
Fluid, mainly issuing from a nozzle, that are turbulent and contain dispersed particles. *1983*

particle precipitation
The precipitation of particles other than electrons and protons. *1980*

particles
Elementary subatomic particles such as protons, electrons or neutrons. Very small pieces of matter. In celestial mechanics, hypothetical entities which respond to gravitational forces but which exert no appreciable gravitational force on other bodies, thus simplifying orbital computations. *SP-7 1968*

parts
Use components

Pascal (programming language)
High order computer programming language developed by Niklaus Wirth originally as an educational tool to foster structured programming. *1980*

passive nosetip technology
Use PANT program

paste (consistency)
Mixtures with characteristic soft or plastic consistencies. *1980*

pastes
Adhesive compositions having a characteristic plastic-type consistency, that is, high order of yield values, such as that of pastes prepared by heating a mixture of starch and water and subsequently cooling the hydrolyzed product. *ASTM (D 907, D-14) 1968*

pathogens
Disease-producing agents, usually refering to living organisms. *DOE 1969*

patriot missile
Surface to air, antiaircraft missile. *1977*

payload assist module
Rocket vehicle with a spinning solid-propellant motor to attain injection velocity to place payload into intended orbits from the parking orbits of the STS. *1980*

payload control
Execution of events involved in operating the payload and supporting systems. *1981*

payload delivery (STS)
The transport of payloads via the Space Transportation System including ground to earth orbit delivery by the Space Shuttle and orbit to orbit delivery via orbit transfer vehicles. *1979*

payload deployment & retrieval system
System of mechanical and control devices, with associated data systems, for payload handling in space. *1980*

payload integration plan
Procedures providing for compatibility of spaceborne experiments with the carrier spacecraft (e.g., shuttle orbiter). *1979*

payload transfer
The in-space movement of payloads from point to point. *1982*

payloads
Originally, the revenue producing portions of an aircraft's load, e.g., passengers, cargo, and mail. By extension, that which an aircraft, rocket, or spacecraft carries over and above which is necessary for the operation of the vehicle for its flight. *SP-7 1968*

PBB
Use polybrominated biphenyls

PCM (materials)
Use phase change materials

PCM (modulation)
Use pulse code modulation

PDM (modulation)
Use pulse duration modulation

pearlite
An aggregate in steel of ferrite and cementite. *DOE 1968*

peat
Dark brown or black residuum produced from the partial decomposition and disintergration of mosses, hedges, trees, and other plants that grow in marshes and other wet places. *1979*

Peclet number
A nondimensional number arising in problems of heat transfer in fluids. *SP-7 1968*

peculiar stars
Stars with spectra that cannot be conveniently fitted into any of the standard spectral classifications. They are denoted by a 'p' after their spectral type. *1981*

PEEK
A class of semicrystalline polymers called polyayrlene ethers for use as molding compounds and for use as composite matrix materials. Used for polyetheretherketones. *1987*

Peltier effects
The effects which result in the production or absorption of heat at the junction of two metals on the passage of an electrical current. *SP-7 1968*

penalty function
In mathematics, a function used in treating maxima and minima problems subject to restraints. *1978*

penetrating particles
Use corpuscular radiation

penetration
The depths to which one material extends into or penetrates another. *ASTM (C 709, C-5) 1968*

penetration ballistics
Use terminal ballistics

Penning discharge
A direct current discharge where electrons are forced to oscillate between two opposed cathodes and are restrained from going to the surrounding anode by the presence of a magnetic field. *SP-7 1968*

Penning effect
An increase in the effective ionization rate of a gas due to the presence of a small number of foreign metastable atoms. *SP-7 1968*

perceptual errors
Deviations from accuracy in the perception of objects, shapes, colors, weights, etc. through the use of the senses. *1980*

perfect gas
Use ideal gas

perfusion
Use diffusion

perigees
Those orbital points nearest the earth when the earth is the center of attraction. *SP-7 1968*

perihelions
Those points in solar orbits which are nearest the sun. *SP-7 1968*

period doubling
The bifurcation of a nonlinear system to two stable periodic cycles on its route to chaotic turbulence. *1987*

periodic orbits
Use orbits

periodic processes
Use cycles

peripheral equipment (computers)
Equipment that works in conjunction with a computer but is not part of the computer itself. Card or paper-tape readers or punches, magnetic tape handlers, or line printers are among items of peripheral equipment. *1976*

periscopes
Optical instruments which displace the line of sight parallel to itself to permit a view which may otherwise be obstructed.
SP-7 1968

permafrost
Any soil, subsoil or other surficial deposit, or even bedrock, occurring in arctic or subarctic regions at a variable depth beneath the Earth's surface in which a temperature below freezing has existed continuously for a long time. Used for frozen soils.
DOE 1968

permeability
Of a magnetic material, the ratio of the magnetic induction to the magnetic field intensity in the same region. The ability to permit penetrations or passage. In this sense the term is applied particularly to substances which permit penetration or passage of fluids. *SP-7 1968*

perovskites
Minerals with a close-packed lattice and the general formula ABX3 where A and B are metals and X is a nonmetal, usually O.
DOE 1968

perturbation
Any departure introduced into an assumed steady state of a system, or a small departure from a nominal path such as a desired trajectory. Usually used as equivalent to small perturbation. Specifically, a disturbance in the regular motion of a celestial body, the result of a force additional to that which causes the regular motion, specifically a gravitational force. *SP-7 1968*

petri nets
Abstract, formal models of the information flow in systems with discrete sequential or parallel events. The major use has been the modeling of hardware systems and software concepts of computers. *1979*

petroleum products
Materials derived from petroleum, natural gas, and asphalt deposits. Includes gasolines, diesel and heating fuels, lubricants, waxes, greases, petroleum coke, petrochemicals, and sulfur. *1978*

petrology
That branch of geology dealing with the origin, occurrence, structure, and history of rocks, especially igneous and metamorphic rocks. *DOE 1968*

PFM (modulation)
Use pulse frequency modulation

phase angle
Use phase shift

phase change materials
Materials undergoing solid/liquid phase transformations and whose latent heat of fusion properties are used to store and deliver thermal energy, usually solar energy. Used for PCM (materials). *1981*

phase conjugation
Technique for the removal of phase distortions during propagation of laser beams through the atmosphere. *1981*

phase detectors
Devices that continuously compare the phase of two signals and provide an output proportional to their difference in phase.
SP-7 1968

phase deviation
The peak difference between the instantaneous phase of the modulated wave and the carrier frequency. *SP-7 1968*

phase matching
A way of maximizing the coupling between two systems used in second harmonic generation which happens mostly in crystals.
1981

phase modulation
Angle modulation in which the angle of a sine wave carrier is caused to depart from the carrier angle by an amount proportional to the instantaneous value of the modulation wave. Combinations of phase and frequency modulation are commonly referred to as frequency modulation. *SP-7 1968*

phase response
Use frequency response
phase shift

phase shift
The phase difference of two periodically recurring phenomena of the same frequency, expressed in angular measure. The angle between the lines connecting a celestial body and the sun and a a celestial body and the earth. Used for phase angle and phase response. *SP-7 1968*

phase velocity
Of a traveling plane wave at a single frequency, the velocity of an equiphase surface along the wave normal. *SP-7 1968*

phenology
A branch of science dealing with the relations between climate and periodic biological phenomena. *DOE 1972*

Phobos
A satellite of Mars orbiting at a mean distance of 9,400 kilometers.
SP-7 1969

Phoebe
A satellite of Saturn orbiting at a mean distance of 12,960,000 kilomerers. *SP-7 1988*

phosphazene
A ring or chain polymer that contains alternating phosphorus and nitrogen atoms, with two substituents on each phosphorus atom.
1981

phosphorescence
Emission of light which continues after the exciting mechanism has ceased. *SP-7 1968*

phosphoric acid fuel cells
Long life fuel cells for the low to medium wattage range which use phosphoric acid as an electrolyte. *1981*

phosphors
Phosphorescent substances such as zinc sulfide, which emit light when excited by radiation, as on the scope of a cathode ray tube. *SP-7 1968*

photoacoustic spectroscopy
An optical technique for investigating solid and semisolid materials, in which the sample is placed in a closed chamber filled with a gas and illuminated with monochromatic radiation of any desired wavelength, and with intensity modulated at some acoustic frequency. Absorption of radiation results in a periodic heat flow from the sample, which generates sound detectable with a sensitive microphone. *1980*

photocathodes
Electrodes used for obtaining photoelectric emission. *SP-7 1968*

photocells
Use photoelectric cells

photochemical oxidants
Any of the chemicals which enter into oxidation reactions in the presence of light or other radiant energy. *1977*

photochemical reactions
Chemical reactions which involve either the absorption or emission of radiation. Used for photochemistry and photoreduction. *SP-7 1968*

photochemistry
Use photochemical reactions

photoclinometry
Use photogrammetry

photoconductive cells
Photoelectric cells whose electrical resistance varies with the amount of illumination falling upon the sensitive area of the cell. *SP-7 1968*

photocurrents
Use photoelectric emission

photodetectors
Use photometers

photodissociation
The dissociation (splitting) of a molecule by the absorption of a photon. The resulting components may be ionized in the process (photoionization). *SP-7 1968*

photoelectric cells
Transducers which convert electromagnetic radiation in the infrared, visible, and ultraviolet regions into electrical quantities such as voltage, current, or resistance. Used for photocells. *SP-7 1968*

photoelectric effect
The emission of an electron from a surface as the surface absorbs a photon of electromagnetic radiation. Electrons so emitted are termed photoelectrons. *SP-7 1968*

photoelectric emission
The emission of electrons from atoms or molecules. Used for photocurrents, photoemission, and photoemissivity. *ASTM (E 673, E-42) 1968*

photoelectrochemical devices
Electrochemical devices powered by light or other incident radiation to produce electricity and/or chemical fuels (e.g., hydrogen). *1978*

photoelectrochemistry
The study of the interaction between impinging light energy and the electropotential of the chemical changes in the electrode, electrolytic solution, or a photosensitive membrane. *1981*

photoelectronics
Use electronics

photoelectrons
Electrons which have been ejected from their parent atoms by interaction between those atoms and high energy photons. *SP-7 1968*

photoemission
Use photoelectric emission

photoemissivity
Use emissivity
photoelectric emission

photogrammetry
The art of science of obtaining reliable measurements by means of photography. Used for photoclinometry. *SP-7 1968*

photoionization
The ionization of an atom or molecule by the collision of a high energy photon with the particle. *SP-7 1968*

photolithography
The process of making a printing plate by exposing a design photographically on a sensitized emulsion and removing unwanted portions chemically. *1977*

photoluminescence
Luminescence produced by the absorption of radiant flux. distinguished from ordinary reflection by a time delay and usually, an upward shift in a wavelength. *ASTM (E 284, E12) 1968*

photomasks
In the production of integrated circuit devices, repeated arrays of microphotographs of the circuit patterns on glass substrates used to form successive patterns on single wafers often of submicrometer sizes. *1980*

photometers
Instruments for measuring the intensity of light or the relative intensity of a pair of lights. Used for microphotometers and photodetectors. *SP-7 1968*

photometry
The study of the measurement of the intensity of light. *SP-7 1968*

photomultiplier tubes
Phototubes with one or more dynodes between its photocathode and output electrode. Used for electron multipliers and multiplier phototubes. *SP-7 1968*

photons
According to the quantum theory of radiation, the elementary quantities of radiant energy. They are regarded as discrete quantities having a momentum equal to hv/c, where h is the Planck constant, v is the frequency of the radiation, and c is the speed of light in a vacuum. Photons are never at rest, have no electric charges and no magnetic moments, but they have spin moments. The energy of a photon (the unit quantum of energy) is equal to hv. *SP-7 1968*

photophoresis
Production of unidirectional motion in a collection of very fine particles, suspended in a gas or falling in a vacuum, by a powerful beam of light. *1985*

photoreduction
Use photochemical reactions

photosphere
The intensely bright portion of the sun visible to the unaided eye. *SP-7 1968*

photosynthesis
A process operating in green plants in which carbohydrates are formed under the influence of light with chlorophyl serving as a catalyst. *SP-7 1968*

photothermal conversion
Conversion into thermal energy from optical radiation by a photoabsorptive or photoselective material. *1980*

photothermotropism
Use anisotropy

photovoltaic cells
Photoelectric detectors capable of directly generating an electric current in response to irridation. *ASTM (E 284, E-12) 1968*

phugoid oscillations
Use oscillations
oscillators
pitch (inclination)

physics and chemistry experiment in space
A group of Space Shuttle payloads consisting of various space experiments. Used for PACE. *1980*

physiography
Use geomorphology

physiological acceleration
The acceleration experienced by a human or an animal test subject in an accelerating vehicle. *SP-7 1968*

physiological telemetry
Use biotelemetry

physiology
The science that treats of the functions of living organisms or their parts, as distinguished from morphology or anatomy. *SP-7 1968*

phytoplankton
The aggregate of passively floating or drifting plant organisms in aquatic ecosystems. *1986*

phytotrons
Apparatus for the growth of plants under a variety of controlled environmental conditions. Used for germinators and growth chambers. *1976*

pickling (metallurgy)
Preferential removal of oxide or mill scale from the surface of a metal by immersion usually in an acidic or alkaline solution. *1976*

pickoffs
Use sensors

pickups
Use sensors

picture elements
Use pixels

piezoelectric ceramics
Ceramic material with piezoelectric properties similar to those of some natural crystals. *1980*

piezoelectric transducers
Transducers utilizing piezoelectric elements. *SP-7 1968*

piezoelectricity
The property exhibited by some asymetrical crystalline materials which when subjected to strain in suitable directions develope polarization proportional to the strain. *SP-7 1968*

pilot induced oscillation
Oscillations of a flying aircraft caused by transients and system changeovers, by pilot overreaction upon such transients, or by misleading pilot cues or excessive pilot gain in modern high-gain, high order aircraft control systems. *1985*

pinch effect
The result of an electromechanical force that constricts, and sometimes momentarily ruptures, a molten conductor carrying current at a high density. The self contradiction of a plasma column carrying large currents due to the interaction of this current with its own magnetic field. *SP-7 1968*

pinhole cameras
Cameras which have no lenses, but consist essentially of a darkened box with a small hole in one side, so that an inverted image of outside objects is projected on the opposite side where it is recorded on photographic film. *1981*

pinning
Sites within a superconducting material that are produced by localizing inclusions, dislocations, voids, etc., which provide a means of resisting flux motion (flux jumps) due to Lorenz forces. SN (limited to electronics). *1981*

Pioneer Venus Orbiter
Use Pioneer Venus 1 spacecraft

Pioneer Venus 1 spacecraft
This orbiter spacecraft is the first of two launched on a seven month journey to observe the planet Venus, its atmosphere and clouds. It was launched May 20, 1978 and is still operational. Used for Pioneer Venus Orbiter. *1978*

Pioneer Venus 2 entry probes
Collective term for the five Pioneer Venus atmospheric probes. They are Pioneer Venus 2 day probe, Pioneer Venus 2 night probe, Pioneer Venus 2 North probe, Pioneer Venus 2 sounder Probe, and Pioneer Venus 2 transporter bus. *1978*

Pioneer Venus 2 spacecraft
This multiprobe spacecraft, launched on its Venus mission in August 1978, comprises a Transporter Bus, a Sounder probe, and three identical probes (North, night, and day) which separately investigated and photographed the atmosphere, clouds and related phenomena. The multiprobe spacecraft traveled about 354 million kilometers. It entered Venus atmosphere on December 9, 1978 and all probes transmitted data. Used for Pioneer Venus 2 Multiprobe spacecraft. *1978*

Pioneer Venus 2 Multiprobe spacecraft
Use Pioneer Venus 2 spacecraft

pipelining (computers)
Processing techniques for improving the capability of computer systems by modelling, sequencing control, resource allocation, etc. *1978*

piston engines
Engines, especially internal combustion engines, in which a piston or pistons moving back and forth work upon a crankshaft or other device to create rotational movement. Used for reciprocating engines. *SP-7 1968*

pitch (inclination)
Of a vehicle, an angular displacement about an axis parallel to the lateral axis of the vehicle. Used for damping in pitch, phugoid oscillations, and pitch angles. *SP-7 1968*

pitch (material)
The residues from the destructive distillation of tars. *DOE 1968*

pitch angles
Use pitch (inclination)

pitot tubes
Open ended tubes or tube arrangements which, when pointed upstream, may be used to measure the stagnation pressure of the fluid for subsonic flow; or the sagnation pressure behind the tube's normal shock wave for supersonic flow. (Pronounced pee-toe. After Henri Pitot, 1695-1771, French scientist.) Used for Preston tubes. *SP-7 1968*

pivots
The paths followed by a point in a diameter of a circle as the circle rolls along in a straight line. Used for trochoids. *SP-7 1968*

PIX
Use plasma interaction experiment

pixels
Shortened term for 'picture elements'. They are image resolution elements in vidicon-type detectors. Used for picture elements. *1986*

plages (faculae)
Use faculae

plane strain
A deformation of a body in which the displacement of all points in the body are parallel to a given plane, and the displacement values are not dependent on the distance perpendicular to the plane. *1980*

planetary boundary layer
The layer of the atmosphere from the earth's surface to the geostrophic wind level, including the surface boundary layer and the Ekman layer. *1980*

planetary cores
The centers of planets. *1977*

planetary craters
Collective term for craters on any of the planetary surfaces. *1978*

planetary crusts
The outermost layers of planets. The planetary crusts are on top of the mantle and are modified by various processes of weathering, sedimentation, metamorphosis, volcanism, and bombardment by meteorites. *1987*

planetary entry
Use atmospheric entry

planetary geology
Study or science of a planet, its history, and its life as recorded in the rocks. Includes the study of the surfacefeatures, the geometry of rock formations, weathering and erosion,and sedimentation. *1980*

planetary limb
In astronomy, the circular outer edge of a planet. *1980*

planetary systems
Systems consisting of a star and the planets and other objects in orbit around it. *1987*

planetary waves
Waves on uniform currents in two-dimensional nondivergent fluid systems rotating with varying angular speeds about the local vertical (beta plane). These waves represent a special case of barotropic disturbance, conserving absolute vorticity. As applied to atmospheric flow, the planetary waves takes into account the variability of the Coriolis parameter while assuming the motion to be two-dimensional. Used for long waves (meteorology) and Rossby waves. *1980*

planetesimals
Use protoplanets

planets
Celestial bodies of the solar system, revolving around the sun in nearly circular orbits, or similar bodies revolving around stars. The larger of such bodies are sometimes called principal planets to distinguish them from asteroids, planetoids, or minor planets, which are comparatively small. The larger planets are accompanied by satellites such as the moon. Inferior planets have orbits smaller than that of the earth; superior planets have orbits larger than that of the earth. The four planets nearest the sun are called inner planets; the others, outer planets. The four largest planets are called major planets. The four planets commonly used for celestial observations are called navigational planets. The word planet is of Greek origin, meaning, literally, wanderer, applied because the planets appear to move relative to the stars. *SP-7 1968*

planigraphy
Use tomography

plankton
The aggregate of passively floating or drifting plant and animal organisms which provide the major source of sustenance for animal life in the aquatic ecosystem. Used for plankton bloom. *1968*

plankton bloom
Use plankton

plant design
Encompasses all design consideration of physical plants, i.e., airports, industral plants, test facilities, etc. Structural is just one aspect of this design. SN (excludes biological plants) *1981*

plant stress
Stimulus or a series of stimuli of such magnitude as to disrupt the growth and/or survival of plants. *1980*

plasma antennas
An air plasma made by ionizing the atmosphere which acts as the conducting element of an RF antenna. *1982*

plasma arc cutting
Use of plasma torches for cutting hard materials at extremely high temperatures. *1980*

plasma bubbles
Pockets of very low electron density in the equatorial F region of the ionosphere in which the plasma density is lower than the ambient density. *1982*

plasma clouds
Specifically, a mass of ionized gas flowing out of the sun. *SP-7 1968*

plasma compression
Decrease in volume and consequent increase in density of a plasma usually by the applicaton of an intense magnetic field. *1980*

plasma cooling
Temperature control of plasmas in controlled fusion operations. *1980*

plasma core reactors
Nuclear reactors utilizing fissionable plasmas (such as uranium fluoride) for the fuel. *1976*

plasma currents
Electric currents induced in plasmas by injection of fast ion beams or some other means. *1980*

plasma display devices
Digital matrix flat panel devices in which small gas discharge plasma cells are used as light emitting sources. *1977*

plasma drift
Movement in the ionosphere of ion and plasma concentration by electric field variations in the upper atmosphere. *1980*

plasma engines
Reaction engines using magnetically accelerated plasma as a propellant. Plasma engines are types of electrical engines. *SP-7 1968*

plasma equilibrium
Condition of plasma in which the constituent particles or fluid elements are unaccelerated or collectively at rest in steady flow. *1979*

plasma etching
Removal of material by use of a focused plasma beam. *1981*

plasma focus
A highly compressed plasma. *1978*

plasma generation
Use plasma generators

plasma generators
Machines, such as electric arc chambers, that will generate very high heat fluxes to convert neutral gases into plasmas. Devices which use the interaction of plasmas and electrical field to generate currents. Used for plasma generation. *SP-7 1968*

plasma interaction experiment
A NASA Lewis experiment, the first of which was launched piggyback with Landsat 3 in 1978 to study the charged particle space plasma environment and its effect on spacecraft surfaces operating at high voltages. The experiment lasted several hours as planned. The second was launched piggyback with Iras in 1983. Used for PIX. *1978*

plasma pumping
Application of radiation of appropriate frequencies to plasma to increase the population of atoms or molecules in the higher energy states. *1979*

plasma renin activity
Use immunoassay

plasma sheaths
The boundary layers of charged particles between plasmas and their surrounding walls, electrodes, or other plasmas. Envelopes of ionized gases that surround bodies moving through an atmosphere at hypersonic velocities. *SP-7 1968*

plasma sound waves
Use magnetohydrodynamic waves

plasma torches
Burners which attain 50,000 degrees C temperatures by the use of plasma gas injected into an electric arc. Plasma torches are used for welding, spraying molten metal, and cutting hard rock or hard metals. *1980*

plasmadynamic lasers
Stimulated emission devices in which the lasing gas flow has been replaced with a lasing plasma flow of atoms or ions. *1978*

plasmas (physics)
Electrically conductive gases comprized of neutral particles, ionized particles, and free electrons but which, taken as a whole, are electrically neutral. Plasmas are further characterized by relatively large intermolecular distances, large amounts of energy stored in the internal energy levels of the particles, and the presence of plasma sheaths at all boundaries of the plasma. Plasmas are sometimes referred to as a fourth state of matter. Used for electrostatic plasma, ionized plasma, magnetoionic plasma, magnetoplasmas, and plasmoids. *SP-7 1968*

plasmasphere
Envelope of highly ionized gases surrounding the earth or another planet. *1979*

plasmoids
Use plasmas (physics)

plastic properties
The tendency of a loaded body to assume a deformed state other than its original state when the load is removed. Used for plasticity. *SP-7 1968*

plasticity
Use plastic properties

plastics
Materials that contain as an essential ingredient one or more organic polymeric substances of large molecular weight, are solid in their finished state, and at some stage in their manufacture or processing into finished articles can be shaped by flow. *ASTM (F 412, F-17; D 883, D-20) 1968*

plates (tectonics)
Rigid divisions of the outer surface of the earth (lithosphere) which moves over a weaker layer (asthenosphere). The plates are about 100 km thick, and the continents, which are 40 km thick, rest on the plates and moves with them. *1980*

ply orientation
The arrangement of bonded layers comprising laminated materials to obtain optimal strength or other characteristics. *1980*

pneumatics
The branch of physics dealing with the mechanical properties of gases with particular emphasis on gas statics in closed systems. *1968*

Pockels effect
Use birefringence

point matching method (mathematics)
Use boundary value problems

point spread functions
Mathematical functions involved in image processing. *1978*

Poiseuille flow
Use laminar flow

Poisson process
Use stochastic processes

polar auroras
Use auroras

polar coordinates
In a plane, a system of curvilinear coordinates in which a point is located by its distance r from the origin (or pole) and by the angle theta which a line (radius vector) joining the given point and the origin makes a fixed reference line, called the polar axis. In three dimensions, short for space polar coordinates. *SP-7 1968*

polar wandering (geology)
Migration during geologic time of the earth's poles of rotation and magnetic poles. Also known as polar migration. Used for Chandler motion. *1976*

polarimeters
Instruments for determining the degree of polarization of electromagnetic radiation, specifically the polarization of light. Used for spectropolarimeters. *SP-7 1968*

polariscopes
Instruments for detecting polarized radiation and investigating its properties. *SP-7 1968*

polarity
The sign of the electric discharge associated with a given object, as an electrode or an ion. *SP-7 1968*

polarization
The state of electromagnetic radiation when transverse vibrations take place in some regular manner, e.g., all in one plane, in a circle, in an ellipse, or in some other definite curve. With respect to particles in an electric field, the displacement of the charge centers within a particle in response to the electric force acting thereon. The response of the molecules of a paramagnetic medium (such as iron) when subjected to a magnetic field. *SP-7 1968*

polarizers
Devices for polarizing radiant energy. *SP-7 1968*

pollution transport
Dispersing or diffusion of atmospheric or water pollutants. Used for atmospheric loading. *1980*

poloidal flux
Plasma confinement concept with multipole magnetic fields. *1980*

polyacetylene
An aliphatic organic polymer that has high semiconductor properties which can be enhanced by doping. *1982*

polybrominated biphenyls
A group of 209 chemicals whose toxicity varies and includes principally one fire retardant called firemaster. Used for PBB. *1982*

polyesters
Polymers in which the repeated structural unit in the chain is of the ester type. *ASTM (D 883, D-20) 1968*

polyetheretherketones
Use PEEK

polymer matrix composites
Materials consisting of reinforcing fibers, filaments, and/or whiskers embedded in polymeric bonding matrices for increased mechanical and physical properties. *1977*

polymerization
A chemical reaction in which the molecules of monomers are linked together to form polymers. *ASTM (D 883, D-20) 1980*

polynuclear organic compounds
Hydrocarbon molecules with two or more nuclei and with or without oxygen, nitrogen, or other elements. *1980*

polynucleotides
Linear sequences of esters of nucleotides and phosphoric acid. *1977*

polypeptides
In organic chemistry, chains of amino acids linked by peptide bonds but with lower molecular weights than proteins; obtained by synthesis or by partial hydrolysis of proteins. *1977*

polyvinyl fluoride
DuPont's Tedlar, unplasticized PVF films with outstanding resistance to ultraviolet radiation. Used for Tedlar (trademark). *1980*

positive feedback
Feedback which results in increasing the amplification. Used for regenerative feedback. *SP-7 1968*

positive ions
Group of atoms which has acquired a positive electric charge by the loss of one or more electrons. *1979*

positrons
Subatomic particles which are identical to electrons in atomic mass, theoretical rest mass, and energy, but opposite in sign. *SP-7 1968*

postlaunch reports
Memoranda issued following spacecraft launchings to report launch data, the launch vehicle performance, orbital elements (expected and measured), and current status. *1977*

postmission analysis (spacecraft)
A broader term than postflight analysis which deals with the scientific aspects of a mission. *1981*

potential energy
Energy possessed by a body by virtue of its position in a gravity field in contrast with kinetic energy, that possessed by virtue of its motion. *SP-7 1968*

potential gradients
In general, the local space rate of change of any potential, as the gravitational potential gradient or the velocity potential gradient. *SP-7 1968*

potentiometers
Instruments for measuring differences in electric potential by balancing the unknown voltage against a variable known voltage. If the balancing is accomplished automatically, the instrument is called a self balancing potentiometer. A variable electric resistor. *SP-7 1968*

powder (particles)
An aggregate of discrete particles that are usually within the size range 1 to 1,000 mm. *ASTM (B 243, B-9) 1968*

powder metallurgy
The art of producing metal powders and of the utilization of metal powders for the production of massive materials and shaped objects. *ASTM (B 243, B-9) 1968*

power density (electromagnetic)
Use radiant flux density

power factor controllers
A solid state electronic device that reduces excess energy waste in AC induction motors by providing only the amount of voltage required to satisfy a given load. *1983*

power gain
The ratio of the power that a transducer delivers to a specified load, under specified operating conditions, to the power absorbed by its input circuit. Of an antenna, in a given direction, 4 pi times the ratio of the radiation intensity in that direction to the total power delivered to the antenna. *SP-7 1968*

power modules (STS)
Modules for providing power for payloads for STS and mission dependent equipment. *1979*

power transmission (lasers)
Space-to-earth power transmission utilizing a laser (from solar power satellites). *1980*

powered models
Models that can be tested in complete force equilibrium, including propulsion. *1982*

Poynting-Robertson effect
The gradual decrease in orbital velocity of a small particle such as a micrometeorite in orbit about the sun due to the absorption and remission of radiant energy by the particle. *SP-7 1968*

PPM (modulation)
Use pulse position modulation

Prandtl number
A dimensionless number representing the ratio of momentum transport to heat transport in a flow. (After Ludwig Prantl, 1875-1953, German scientist). *SP-7 1968*

pre-Imbrian period
One of four stratigraphic classifications adopted for displaying (on maps) the geological ages of major features on the moon. *1980*

pre-main sequence stars
Stars in which nuclear reactions that take place in its core have not yet occurred. *1984*

preamplifiers
Amplifiers, the primary function of which is to raise the output of a low level source to an intermediate level so that the signal may be further processed without appreciable degradation in the signal-to-noise ratio. In radar amplifiers separated from the remainder of the receiver and located so as to provide the shortest possible input circuit path from the antenna so as to avoid deterioration of the signal-to noise ratio. Used for preselectors. *SP-7 1968*

precession
Change in the direction of the axis of rotation of a spinning body, as a gyro, when acted upon by a torque. *SP-7 1968*

precipitation (chemistry)
The separation of a new phase from solid or liquid solution, usually with changing conditions of temperature or pressure or both. *ASTM (E 7, E-4) 1968*

precipitation (meteorology)
The precipitation of water from the atmosphere in the form of hail, mist, rain, sleet, and snow. Deposits of dew, fog, and frost are excluded. *ASTM (D 1356, D-22) 1968*

precision
The quality of being exactly or sharply defined or stated. A measure of the precision of a representation is the number of distinguishable alternatives from which it was selected, which is sometimes indicated by the number of significant digits it contains. Used for exactness. *SP-7 1968*

precision guided projectiles
Missiles guided by precise laser radiation. *1979*

prelaunch summaries
Summaries prior to launch of the preparations and parameters of the mission. *1981*

premixing
The mixing of ingredients prior to a specified action (mixing of fuel and air prior to ignition in combustion, for example). *1980*

prepolymers
Polymers of degrees of polymerization between that of the monomer or monomers, and the final polymer. *ASTM (D 883, E-2) 1968*

prepregs
The reinforcing materials containing or combined with the full complement or resin before molding operations in the production of composite materials. *1980*

preselectors
Use preamplifiers

presidential reports
Formal reports originated by the President or his office. *1977*

presintering
Use sintering

pressure
Force or load per unit area. Used for surface pressure.
ASTM (D 123, D 1777; D-13) 1968

pressure breathing
The breathing of oxygen or a suitable mixture of gases at a pressure higher than the surrounding pressure. *SP-7 1968*

pressure dependence
Study of how a rate constant changes with pressure. *1981*

pressure modulator radiometers
A cell containing a known quantity of a gas is placed in the single optical path of the radiometer and subjected to cyclical pressure changes which alter the absorption lines in the infrared spectrum of the gas. A narrow band signal results from the different voltages at the detector at high and low cell pressures. A wideband signal is generated by physically chopping a percentage of the input beam with a rotating chopper blade. *1981*

pressure ratio
The relationship of a force to the deformation of a system whose deformation varies in some proportion to the force. *1980*

pressure suits
Garments designed to provide pressure upon the body so that the repiratory and circulatory functions may continue normally, or nearly so, under low pressure conditions, such as occur at high altitudes or in space without benefit of pressurised cabins.
SP-7 1968

Preston tubes
Use pitot tubes

prevaporization
The phase transformations of liquids to gases prior to some physical or chemical reaction. *1980*

primers (coatings)
Coatings designed to enhance adhesion.
ASTM (C 717, C-24) 1968

primitive equations
Eulerian equations of fluid motion in which the primary dependent variables are the fluid's velocity components. The equations govern a wide variety of fluid motions and form the basis of most hydrodynamical analysis. *1979*

prisms
Transparent bodies with at least two polished plane faces inclined with respect to each other, from which light is reflected or through which light is refracted. When light is refracted by a prism whose refractive index exceeds that of the surrounding medium, it is deviated or bent toward the thicker part of the prism.
ASTM (E 175, E-25) 1968

privacy
Freedom from observation and/or intrusion. Applies to such things as communications, personal records, photographs. *1979*

process control (industry)
The ways and means by which continuous manufacturing and other industrial processes are monitored and maintained to create products of planned, uniform dimension and quality. *1978*

process heat
Increase in enthalpy accompanying chemical reactions or phase transformations at constant pressure (heat of crystallization and heat of sublimation are examples). *1980*

production costs
The process of fabrication, from raw materials through the finished products, including packaging and other prorated costs. *1980*

Project SETI
A program to search for extraterrestrial intelligence by means of radio communication. Used for Search for Extraterrestrial Intelligence and SETI. *1977*

projectile penetration
Use terminal ballistics

projectiles
Objects, especially missiles, fired, thrown, launched, or otherwise projected in any manner, such as bullets, guided rocket missiles, sounding rockets, or pilotless airplanes. Originally, objects, such as bullets or artillery shells, projected by applied external forces.
SP-7 1968

prolate spheroids
Ellipsoids of revolutions, the longer axis of which is the axis of revolution. *SP-7 1968*

prop-fan technology
Technology of a small diameter, highly loaded, many-bladed variable pitch advanced turboprop. *1981*

propagation
The spreeding abroad or sending forward, as of radiant energy. Used for propagators. *SP-7 1968*

propagators
Use propagation

propargyl groups
Crosslinking agents for certain aromatic polyamides used as matrix resins in fiber composites. *1981*

propellant explosions
Detonations of propellants as a result of motor malfunction. *1980*

propellants
Any agents used for consumption or combustion in rockets and from which the rockets derive their thrust, such as fuels, oxidizers, additives, catalysts, or any compounds of mixture of these; specifically, fuels, oxidants, or a combination of mixture of fuels and oxidants used in propelling rockets. Propellants are commonly in either liquid of solid form. *SP-7 1968*

proportional control
Control of an aircraft, rocket or spacecraft in which the control surface deflection is proportional to the movement of the remote controls. *SP-7 1968*

propulsive efficiency
The efficiency with which energy available for propulsion is converted into thrust by a rocket engine. *SP-7 1968*

protein synthesis
Process by which protein molecules are formed. *1980*

protium
Use light water

proton-proton reactions
Thermonuclear reactions in which two protons collide at very high velocities and combine to form deuterons. The resultant deuterons may capture other protons to form tritium and the latter may undergo proton capture to form helium. The proton-proton reactions are now believed to be the principal sources of energy within the sun and other stars of its class. A temperature of 5 million degrees Kelvin and high hydrogen (proton) concentrations are required for these reactions to proceed at rates compatible with enrgy emission by such stars. *SP-7 1968*

protons
Positively charge subatomic particles having a mass of 1.67252 times 10 to the minus 24 gram, slightly less than that of an electron. *SP-7 1968*

protoplanets
Transition objects formed during primeval cloud condensation into stellar systems (stars, planets, etc.) which form the nucleus of planetary accretion. Used for planetesimals. *1979*

proximity effect (electricity)
Redistribution of current in a conductor caused by the presence of another conductor. *1980*

pseudopotentials
Factors in an approximate method for calculation of energy bands in solids by the use of approximation which includes the many body effect. *1982*

psycholinguistics
Study of linguistic behavior such as conditioning by psychological factors including the speaker's and listener's culturally determined categories of expression and comprehension. *1979*

psychology
The science which studies the functions of the mind, such as sensation, perception, memory, thought, and, more broadly the the behavior of an organism in relation to its environment. *SP-7 1968*

psychomotor performance
Of or pertaining to muscular action ensuing directly from a mental process, as in the coordinated manipulation of aircraft or spacecraft controls. *SP-7 1968*

psychopharmacology
The science that deals with the action of drugs on mental function. *1978*

psychrometers
Instruments for measuring humidity through the use of wet and dry bulb thermometers. *ASTM (E 337, D-22) 1968*

PTM (modulation)
Use pulse time modulation

pulse amplitude
A general term indicating the magnitude of a pulse. Used for pulse height. *SP-7 1968*

pulse charging
Rapid and efficient method for charging electric batteries. *1980*

pulse code modulation
Any modulation which involves a pulse code. Used for PCM (modulation). *SP-7 1968*

pulse Doppler radar
A pulse radar system which utilizes the Doppler effect for obtaining information about the target (not including simple resolution from fixed targets). *SP-7 1968*

pulse duration
The time interval between the first and last instances at which the instantaneous amplitude reaches a stated fraction of the peak pulse amplitude. Used for light duration and pulse width. *SP-7 1968*

pulse duration modulation
A form of pulse time modulation in which the duration of a pulse is varied. Used for PDM (modulation), pulse width modulation, and PWM (modulation). *SP-7 1968*

pulse frequency modulation
A form of pulse time modulation in which the pulse repetition rate is the characteristic varied. Used for PFM (modulation). *SP-7 1968*

pulse height
Use pulse amplitude

pulse modulation
Modulation of a carrier by a pulse train. Modulation of one or more characteristics of a pulse carrier. *SP-7 1968*

pulse position modulation
A form of pulse time modulation in which the position in time of a pulse is varied. Also called pulse phase modulation. Used for PPM (modulation). *SP-7 1968*

pulse radar
A type of radar, designed to facilitate range measurement, in which the transmitted energy is emitted in periodic short pulses. *SP-7 1968*

pulse time modulation
Modulation in which the values of instantaneous samples of the modulating wave are caused to modulate the time of occurence of some characteristic of a pulse carrier. Used for PTM (modulation). *SP-7 1968*

pulse width
Use pulse duration

pulse width modulation
Use pulse duration modulation

pulsejet engines
Compressorless jet engines in which combustion takes place intermittantly, producing thrust by a series of explosions, commonly occuring at the approximate resonance frequency of the engine. *SP-7 1968*

pulses
Short-wave trains of mechanical vibration. *ASTM (E 500, E-7) 1968*

pultrusion
Process of pulling continuous lengths of resin impregnated fiber through a shaped, heated die to produce lengths of reinforced plastic. *1980*

pumice
A light-colored, vesicular, glassy rock commonly having the conposition of a rhyolite. *DOE 1968*

push-pull amplifiers
Amplifiers in which there are two identical signal branch circuits so as to operate in phase opposition and with input and output connections each balanced to ground. Used for balanced amplifiers. *SP-7 1968*

pushbroom sensor modes
Spacecraft instrument arrangements in which large numbers of detectors comprising linear arrays are swept by the forward motion of the spacecraft to attain increased fidelity and high sensitivity in the data captured. *1980*

PWM (modulation)
Use pulse duration modulation

pyranometers
Actinometers which measure the combined intensity of incoming direct solar radiation and diffuse sky radiation. The pyranometers consist of a recorder and a radiation sensing element which is mounted so that it views the entire sky. Sometimes called solarimeters. *SP-7 1968*

pyrazines
Compounds that contain a six-membered heterocyclic ring containing nitrogen atoms in the 1 and 4 positions. *DOE 1968*

Pyrex (trademark)
Use borosilicate glass

pyridines
Compounds that contain a six-membered heterocyclic ring containing one nitrogen atom. *DOE 1968*

pyrimidines
Compounds that contain a six-membered heterocyclic ring containing nitrogen atoms in the 1 and 3 positions. *DOE 1968*

pyrographalloy
Use composite materials

pyroheliometers
Actinometers which measure the intensity of direct solar radiation, consisting of a radiation sensing element enclosed in a casing which is closed except for a small aperture, through which the direct solar rays enter, and a recorder unit. Used for heliometry. *SP-7 1968*

pyrohydrolysis
Decomposition by the action of heat and water vapor. *ASTM (C 859, C-26) 1968*

pyrolysis
Chemical decomposition by the action of heat. *SP-7 1968*

pyrometers
Instruments that measures high temperature, e.g. of molten lavas, by electrical or optical means. *DOE 1968*

pyrophyllite
A white, greenish, gray, or brown phyllosilicate mineral that resembles talc. *DOE 1969*

pyroxenes
A group of dark, rock-forming silicate minerals. *DOE 1968*

pyrrhotite
A common reddish-brown to bronze hexagonal mineral. *DOE 1968*

pyrroles
Compounds that contain a five-membered heterocyclic ring containing one nitrogen atom. *DOE 1968*

P78-2 satellite
Use SCATHA satellite

Q

QCD
Use quantum chromodynamics

quadrature approximation
Use quadratures

quadratures
Elongations of 90 deg., usually specified as east or west in accordance with the direction of the body from the sun. The moon is a quadrature at first and last quarters. The situation of two periodic quantileas differing by a quarter of a cycle. Used for quadrature approximation. *SP-7 1968*

quadrupoles
A linear accelerator having four longtudinal vanes in its resonating cavity, which are shaped to create RF electric fields that simultaneously accelerate, bunch, and focus the charged particle beam. *DOE 1968*

quality control
An aggregate of functions designed to insure adequate quality in manufactured products by initial critical study of engineering design, materials, proceses, equipment, and workmanship followed by periodic inspection and analysis. Used for reliability control. *DOE 1968*

quantiles
The values that mark frequency distrubution interval boundaries that are determined by arranging a set of N observations in order of magnitude and marking off equal parts (N/P) of the total population P. *1981*

quantization
Use measurement

quantum chromodynamics
A gauge theory describing the interaction between quarks and gluons. Used for color (particle physics) and QCD. *1979*

quantum efficiency
A measure of the efficiency of conversion or utilization of light or some other form of energy. *1980*

quantum electronics
The branch of electronics that essentially deals with lasers and laser devices which require quantum theory for their exact description. *1984*

quantum theory
The theory first stated by Max Planck (before the Physical Society of Berlin on December 14, 1900) that all electromagnetic radiation is emitted and absorbed in quanta, each of magnitude hv, h being the Planck constant and v the frequency of the radiation. Used for Wightman theory. *SP-7 1968*

quantum wells
Effective potential wells created by a minimum in the conduction band or a maximum in the valence band that arises when a smaller band-gap semiconductor is sandwiched between a larger band-gap semiconductor. *1985*

quark parton model
A theoretical model which summarizes our understanding of how protons and neutrons are made up of the fundamental subparticles called quarks. *1981*

quartz
Crystalline silica, an important rock-forming mineral. *DOE 1968*

quefrencies
In cepstral analysis, the frequency of periodic ripples in a spectra of a signal that contains echoes. Quefrencies are expressed in cycles per hertz or in seconds. *1976*

quenching (atomic physics)
Phenomena in which very strong electric fields cause the orbit of an electron or atom to precess rapidly so the average magnetic moment associated with its orbit angular momentum is reduced to zero. *1978*

quenching (cooling)
Rapid cooling as in metallurgy. Used for flame quenching. *ASTM (E44, E-4) 1968*

query languages
Command languages used to search and retrieve information. *1982*

quinoxalines
A group of heterocyclic compounds consisting of a benzene ring condensed with a diazine ring. *1977*

R

racon beacons
Use radar beacons

radar
A method, system or technique of using beamed, reflected, and timed radio waves for detecting, locating, or tracking objects (such as rockets), for measuring altitude, etc., in any of various activities, such as air traffic control or guidance. The electronic equipment or apparatus used to generate, transmit, receive, and usually, to display radio scanning or locating waves, a radar set. Used for radio assisted detection and ranging. *SP-7 1968*

radar altimeters
Use radio altimeters

radar astronomy
The study of celestial bodies within the solar system by means of radiation originating on earth but reflected from the body under observation. *SP-7 1968*

radar beacons
Beacons transmitting characteristic signals on radar frequency, permitting crafts to determine their bearings and sometimes the range of the beacons. Used for racon beacons. *SP-7 1968*

radar cross sections
The ratios of power returned in a radar echo to power received by the target reflecting the signal. *SP-7 1968*

radar direction finders
Use radio direction finders

radar displays
Use radarscopes

radar geology
The application of imaging radar to geologic problems. *1981*

radar homing missiles
Radar-following missiles designed to attack radar transmitters. *1977*

radar networks
A series of tracking stations each of which can individually or jointly track a target by utilizing an interchange of radar information. Used for multiradar tracking. *1979*

radar range
The distance from a radar to a target as measured by the radar. The maximum distance at which a radar set is effective in detecting targets. *SP-7 1968*

radar reflectors
Devices capable of or intended for reflecting radar signals. *SP-7 1968*

radar scanning
The action or process of moving or directing a searching radar beam. *SP-7 1968*

radar targets
Objects which reflect a sufficient amount of a radar signal to produce an echo signal on the radar screen. *SP-7 1968*

RADARSAT
A civilian remote sensing satellite that will be polar orbiting and is jontly being developed by Canada and the United Kingdom with NASA providing the launch. In addition to a synthetic aperture radar it may carry other instuments such as the Advanced Along Track Scanning Radiometer (AATSR) and the Advanced Radar Altimeter (ARA)/ Ocean Wave Spectrometer (OWS). Launch is planned for 1994. *1983*

radarscopes
The cathode ray oscilliscopes used in radar sets, which display the received signal in such a manner as to indicate things such as range or bearing. Used for radar displays. *SP-7 1968*

radial velocity
In radar, that vector component of the velocity of a moving target that is directed away from or toward the ground station. *SP-7 1968*

radiance
In radiometry, a measure of the intensic radiant intensity emitted by a radiator in a given direction. It is the irradiance (radiant flux density) produced by radiation from the source upon a unit surface area oriented normal to the line between source and receiver, divided by the solid angle subtended by the source at the receiving surface. It is assumed that the medium between the radiator and receiver is perfectly transparent; therefore radiance is independant of attenuation between source and receiver. *SP-7 1968*

radiancy
The rate of radiant energy emission from a unit area of a source in all the radial directions of the overspreading hemisphere. *SP-7 1968*

radiant energy
Use radiation

radiant flux density
The rate of radiant energy emission from a unit area of a source in all the radial directions of the overspreading hemisphere. Used for power density (electromagnetic), radiant intensity, and radiation intensity. *ASTM (C 168, C-16) 1968*

radiant intensity
Use radiant flux density

radiation
The process by which energy is emitted or transferred in the form of photons or electromagnetic waves. Used for radiant energy and radiation emission. *ASTM (E 772, E-44) 1968*

radiation belts
Envelopes of charged particles trapped in the magnetic field of a spatial body. Used for geomagnetically trapped particles and Van Allen radiation belts. *SP-7 1968*

radiation chemistry
The branch of chemistry concerned with the chemical effects, including decomposition, of energetic radiation or particles of matter. *1977*

radiation counters
Instruments used for detecting or measuring moving subatomic particles by a counting process. Used for ionization counters, particle counters, and particle detectors. *SP-7 1968*

radiation dosage
The amount of radiation absorbed by a material, system, or tissue in a given amount of time; usually measured in units as roentgen. Used for radiation exposure. *SP-7 1968*

radiation emission
Use radiation

radiation exposure
Use radiation dosage

radiation intensity
Use radiant flux density

radiation medicine
Use nuclear medicine

radiation pressure
Pressure exerted upon any material body by electromagnetic radiation incident upon it. *SP-7 1968*

radiation sickness
A syndrome following intense acute exposure to ionizing radiation. It is characterized by nausea and vomiting a few hours after exposure. Further symptoms include bloody diarrhea, hemorrhage under the skin (and internally), epilation (hair falling out), and a decrease in blood cell level. *SP-7 1968*

radiation transport
The study of radiation from emission to absorption. *1981*

radiation trapping
Confinement of radiation with a magnetic field. *1980*

radiators
Any sources of radiant energy, especially electromagnetic radiation. Devices that dissipate the heat from something as from water or oil, not necessarily by radiation only. *SP-7 1968*

radio altimeters
Devices that measure the altitude of a craft above the terrain by measuring the elapsed time between transmission of radio waves from the craft and the reception of the same waves reflected from the terrain. Used for radar altimeters. *SP-7 1968*

radio assisted detection and ranging
Use radar

radio astronomy
The study of celestial objects through observation of radiofrequency waves emitted or reflected by these objects. Specifically, the study of celestial objects by measurement of the radiation emitted by them in the radiofrequency range of the electromagnetic spectrum. *SP-7 1968*

radio beacons
Transmiters, together with their associated equipment, that emit signals enabling the determination, by means of suitable receiving equipment, of direction, distance, or position with respect to the beacon. Used for radio ranges. *SP-7 1968*

radio control
Remote control of a pilotless airplane, rocket, or spacecraft by means of radio signals that activate controlling devices. *SP-7 1968*

radio direction finders
Radio receiving sets, together with associated equipment, used to determine the direction from which a radio signal is transmitted. Used for direction finders (radio) and radar direction finders. *SP-7 1968*

radio frequencies
Frequencies at which coherent electromagnetic radiation of energy is useful for communications purposes. *SP-7 1968*

radio frequency ion thrustor engines
Use RIT engines

radio frequency radiation
Use radio waves

radio horizons
Loci or points at which direct rays from a radio transmitter become tangential to the earth's surface. *SP-7 1968*

radio interferometers
Interferometers operating at radio frequencies. Radio interferometers are used in radio astronomy and in satellite tracking. *SP-7 1968*

radio jets (astronomy)
Jets of energetic particles occurring in radio galaxies and quasars usually emitted from the nuclear (active) region of the extragalactic radio source. *1986*

radio meteors
Meteors which have been detected by the reflection of radio signals from the meteor trails of relatively high ion density (ion columns). *SP-7 1968*

radio ranges
Use radio beacons

radio spectra
Frequencies of electromagnetic radiation usable for radio communication. *SP-7 1968*

radio telescopes
Devices for receiving, amplifying, and measuring the intensity of radio waves originating outside the earth's atmosphere or reflected from a body outside the atmosphere. *SP-7 1968*

radio waves
Waves produced by oscillation of an electric charge at a frequency useful for radio communication. Used for radio frequency radiation. *SP-7 1968*

radioactivity
Spontaneous disintegration of atomic nuclei with emission of corpuscular or electromagnetic radiations. The number of spontaneous disintegrations per unit mass and per unit time of a given unstable (radioactive) element, usually measured in curies. *SP-7 1968*

radiobiology
The study of the effects produced on living organisms by radiation. *SP-7 1968*

radiocardiography
The technique of recording of an intravenously injected radioisotope in the heart chambers. *1982*

radioimmunoassay
A medical diagnostic procedure for the components (hormones and immunoglobulins primarily) as well as pharmaceuticals in the blood. The RIA is based on the antigen antibody reactions. *1978*

radiometers
Instruments for detecting and, usually, measuring radiant energy. *SP-7 1968*

radiometric correction
An effort to correct the intensity range of an image. Used for radiometric rectification. *1982*

radiometric rectification
Use radiometric correction

radiometric resolution
The sensitivity of the sensor to distinguish between gray levels. *1981*

radiosondes
Instruments, usually balloonborne, for the simultaneous measurement and transmission of meteorological data while moving vertically through the atmosphere. *SP-7 1968*

radomes
Dielectric housings for antennas. (From RAdar DOME. Pronounced ray-domes). *SP-7 1968*

Raduga satellite
A Soviet communications satellite in geostationary orbit for radio and TV transmission. *1977*

railgun accelerators
Linear dc motors consisting of a pair of rigid, field-producing rails, and a movable conducting armature. *1981*

rain erosion
The wearing away of the land by rain. *1976*

Raman effect
Use Raman spectra

Raman scattering
Use Raman spectra

Raman spectra
Spectra of the modified frequencies resulting from inelastic scattering when matter is irradiated by a monochromatic beam of radiant energy. Used for Raman effect and Raman scattering. *ASTM (E 131, E-13) 1968*

ramjet engines
Jet engines with no mechanical compressor consisting of specially shaped tubes or ducts open at both ends, the air necessary for combustion being shoved into the duct and compressed by the forward motion of the engine, where the air passes through a diffuser and is mixed with fuel and burned, the exhaust gases issuing in a jet from the rear opening. Ramjet engines cannot operate under static conditions. Often called ramjets. Used for athodyds. *SP-7 1968*

random access
The process of obtaining data from, or placing data into, storage when there is no sequential relation governing the access time to successive storage location. *1981*

random errors
Errors that are not systematic, are not erratic, and are not mistakes. *SP-7 1968*

random noise
Oscillations whose instantaneous amplitudes occur, as a function of time according to a normal (Gaussian) curve. Used for Gaussian noise. *SP-7 1968*

random numbers
Expressions formed by sets of digits selected from a sequence of digits in which each successive digit is equally likely to be any of the digits. *SP-7 1968*

random variables
Variables characterized by random behavior in assuming their different possible values. Mathematically, they are described by their probability distribution, which specifies the possible values of a random variable together with the probability associated (in an appropriate sense) with each value. Random variables are said to be continuous if their possible values extend over a continuum and discrete if their possible values are separated by finite intervals. *SP-7 1968*

range errors
Errors in radar range measurment due to the propagation of radio energy through a nonhomogeneous atmosphere. These errors are due to the fact that the velocity of radio wave propagation varies with the index of refraction and that ray travel is not in straight lines through actual atmospheres. The resulting range errors are generally insignificant. *SP-7 1968*

rangelands
Land providing forage for domestic and wild animals, wildlife cover, recreation opportunities, and vegetation for watershed protection. *DOE 1972*

Rankine cycle
An ideal thermodynamic cycle consisting of heat addition at constant pressure, isentropic expansion, heat rejection at constant pressure, and isentropic compression; used as an ideal standard for the performance of heat-engine and heat-pump installations operating with a condensable vapor as the working fluid, such as a steam power plant. *DOE 1968*

rapid quenching (metallurgy)
Rapid cooling of molten metals or alloys to achieve maximum uniformity in the crystal structure. Used for rapid solidification. *1979*

rapid solidification
Use rapid quenching (metallurgy)

rare gas-halide lasers
A class of lasers in which the inert gases are used as the amplifying medium. *1980*

rare gases
Gases such as helium, neon, argon, krypton, xenon, and radon, all of whose shells of planetary electrons contain stable numbers of electrons so that the atoms are almost completely chemically inactive. Used for inert gases and noble gases. *SP-7 1968*

rawinsondes
Combinations of raob and rawin; observations of temperature, pressure, relative humidity, and winds-aloft by means of radiosonde and radio direction finding equipment of radar tracking. *SP-7 1968*

ray acoustics
Use geometrical acoustics

ray optics
Use geometrical optics

ray tracing
A procedure used in the graphical determination of the path followed by a single ray of radiant energy as it travels through media of varying indices of refraction. *SP-7 1968*

Rayleigh scattering
Any scattering process produced by spherical particles whose radii are smaller than about one tenth the wavelength of the scattered radiation. *SP-7 1968*

Rayleigh waves
Two dimensional barotropic disturbances in a fluid having one or more discontinuities in the vorticity profile. Surface waves associated with the free boundary of a solid, such that a surface particle describes an ellipse whose major axis is normal to the surface and whose center is at the undisturbed surface. At maximum particle displacement away from the solid surface the motion of the particle is opposite to that of the wave. *SP-7 1968*

Rayleigh-Benard convection
The flow of a fluid contained between horizontal thermally conducting plates and heated from below. The Rayleigh number is proportional to the temperature difference between the plates. *1983*

rayon
A manufactured fiber composed of regenerated cellulose, as well as manufactured fibers composed of regenerated cellulose in which substituents have replaced not more than 15 percent of the hydrogens of the hydroxyl groups. *ASTM (D-123, D-13) 1968*

RCA Satcom satellites
Domestic commercial communications satellites launched by NASA for the RCA Corporation. *1976*

reaction bonding
Chemical combining of ingredients to produce silicon nitride ceramics. *1980*

reaction jets
Use jet thrust

reaction products
The substances formed in a chemical reaction -- the desired items as well as the unwanted fumes, sludge, residues, etc. *1980*

reaction time
In human engineering, the interval between an input signal (physiological) or a stimulus (psychophysiological) and the response elicited by the signal. Used for reverse time. *SP-7 1968*

reactivity
The ability to react. For proper use of the term, the reaction in question and the conditions should be stated and the parameter used in measuring reactivity indicated, such as rate, uniformity, or the like. *ASTM (D 1695, D-23) 1968*

reactor cores
In nuclear reactors, the regions containing the fissionable material. *SP-7 1968*

reactor fuels
Use nuclear fuels

reactor safety
Theoretical and experimental investigations of the behavior of reactor types and designs under various real or hypothetical accidents. *DOE 1968*

read-only memory devices
Computer devices for storing data in permanent or nonerasable form. Used for ROM devices. *1977*

real time operation
Time in which reporting on events or recording of events is simultaneous with the events. *SP-7 1968*

rearward facing steps
Use backward facing steps

REB
Use relativistic electron beams

receivers
Initial components or sensing elements of measuring systems. For example, the receiver of a thermoelectric thermometer is the measuring thermocouple. Instruments used to detect the presence and to determine the information carried by electromagnetic radiation. Receivers include circuits designed to detect, amplify, rectify, and shape the incoming radio frequency signals received at the antenna in such a manner that the information containing component of the received energy can be delivered to the desired indicating of recording equipment. Used for receiving systems. *SP-7 1968*

receiving systems
Use receivers

receptacles (containers)
Use containers

receptors (physiology)
Sensory nerve endings or organs in a living organism that is sensitive to physical of chemical stimuli. *SP-7 1968*

recharging
The restoring of discharged electic storage batteries to a charged condition by passing direct current through them in a direction opposite to that of the discharging current. *1980*

reciprocating engines
Use piston engines

reciprocity theorem
Any theorem expressing reciprocal relations for the behavior of some physical system in which input and output can be interchanged without altering the response of the system to a given excitation. *1980*

recirculation
Use circulation

recognition
The psychological process in which an observer so interprets the visual or auditory stimuli he receives from a distant object that he forms a correct conclusion as to the exact nature of that object or sound. *SP-7 1968*

recombination coefficient
A measure of the specific rate at which oppositely charged ions join to form neutral particles (a measure of ion recombination). *SP-7 1968*

recrystallization
In metals, the change from one crystal structure to another, as occurs on heating or cooling through a critical temperature. The formation of a new strain free grain structure from that existing in cold worked metal, usually accomplished by heating. *SP-7 1968*

rectangular coordinates
Use Cartesian coordinates

rectennas
Devices that convert microwave energy into direct-current power by utilizing a number of small diodes each with its own diode rectifier. Used for rectifier antennas. *1979*

rectifier antennas
Use rectennas

rectifiers
Static devices having an asymmetrical conduction characteristic which is used to convert attending current into direct current. *SP-7 1968*

recuperators
Use regenerators

red dwarf stars
Red stars of low luminosity, so desigated by E. Hertzsprung. Red Dwarf stars are commonly those main sequence stars fainter than an absolute magnitude of plus 1, and are the faintest and coolest of the dwarfs. *1982*

red giant stars
Stars whose evolution has progressed to the point where hydrogen core burning has been completed, the helium core has become denser and hotter than originally, and the envelope has expanded to perhaps 100 times its initial size. *1976*

red shift
In astronomy, the displacement of observed spectral lines toward the longer wavelengths of the red end of the spectrum. *SP-7 1968*

Redox cells
Cells for converting the energy of reactants to electrical energy; an intermediate reductant in the form of liquid electrolyte reacts at the anode in a conventional manner and is regenerated by reaction with a primary fuel. *1980*

reduced gravity
A condition in which the accelerationacting on a body is less than normal gravity, between 0 and 1 g. Used for low gravity, microgravity, and subgravity. *SP-7 1968*

reefs
Chains of rocks, sand ridges, or coral at or near the surface of water. *DOE 1973*

reentry
The event occurring when a spacecraft of other object comes back into the sensible atmosphere after going to higher altitudes; the action involved in this event. *SP-7 1968*

reentry bodies
Use reentry vehicles

reentry trajectories
Those parts of rocket trajectories that begin at reentry and end at target or at the surface. *SP-7 1968*

reentry vehicles
Any payload carrying vehicles designed to lease the sensible atmosphere and then return through it to earth. Used for reentry bodies. *SP-7 1968*

references (standards)
Use standards

reflectance
The ratio of the radiant flux reflected by a body to that incident upon it. Used for reflection coefficient and reflectivity. *SP-7 1968*

reflected radiation
Use reflected waves

reflected rays
Use reflected waves

reflected waves
Shock waves, expansion waves, or compression waves reflected by another wave incident upon a wall or other boundary. In electronics, radio waves reflected from a surface or object. Used for reflected radiation and reflected rays. *SP-7 1968*

reflecting telescopes
Telescopes which collect light by means of concave mirrors. *SP-7 1968*

reflection
The process whereby a surface of discontinuity turns back a portion of the incident radiation into the medium through which the radiation approached. *SP-7 1968*

reflection coefficient
Use reflectance

reflection nebulae
Any celestial body having a hazy cloudy appearance whose brightness results from the scattering by dust particles of light from nearby stars. *1982*

reflectivity
Use reflectance

reflectometers
Instruments for measuring reflectance. *ASTM (E 772, E-44) 1968*

reflector antennas
Antennas consisting of a reflecting surface and a feed. *1986*

reforestation
The reestablishment of a tree crop on forest land. *1982*

refracted radiation
Use refracted waves

refracted rays
Use refracted waves

refracted waves
Waves that have had their direction of motion changed by refraction. Used for refracted radiation and refracted rays. *SP-7 1968*

refracting telescopes
Telescopes which collect light by means of a lens or system of lenses. *SP-7 1968*

refraction
The process in which the direction of energy propagation is changed as the result of a change within the propagating medium, or as the energy passes through the interface representing a density discontinuity between the two media. In the first instance the rays undergo a smooth bending over a finite distance. In the second case the index of refraction changes through an interfacial layer that is thin compared to the wavelength of the radiation; thus, the refraction is abrupt, essentially discontinuous. *SP-7 1968*

refractive index
Use refractivity

refractivity
The algebraic difference between an index of refraction and unity. Used for refractive index. *SP-7 1968*

refractometers
Instruments for measuring the index of refraction of a liquid, gas, or solid. *SP-7 1968*

refractory coatings
Pyrolytic materials used for coating other materials exposed to high temperatures. *1981*

refractory metals
Usually alloys of high-melting point, hard-to-work metals, but can also refer to certain unalloyed elements. *DOE 1968*

Refrasil (trademark)
Use silicon dioxide

Refsat
A proposed satellite that broadcasts navigation aiding signals to low cost user terminals which employ the constellation of 24 NavStar Global Positioning System (GPS) satellites for position determination. *1981*

regenerative cooling
The cooling of a part of an engine by the fuel or propellant being delivered to the combustion chamber; specifically, the cooling of a rocket engine combustion chamber or nozzle by circulating the fuel or oxidizer, or both, around the part to be cooled. *SP-7 1968*

regenerative feedback
Use positive feedback

regenerators
Devices used in a thermodynamic process for capturing and returning to the process heat that would otherwise be lost. Used for recuperators. *SP-7 1968*

registers (computers)
Devices capable of retaining information, often that contained in a small subset (e.g. one word) of the aggregate information in a digital computer. *SP-7 1968*

regolith
The layer rock or blanket or unconsolidated rocky debris of any thickness that overlies bedrock and forms the surface of the land. *1979*

regression analysis
The statistical counterpart or analog of the functional expression, in ordinary mathematics, of one variable in terms of others. *SP-7 1968*

regulatory mechanisms (biology)
Specific processes by which living organisms control the rates of biochemical and physiological reactions involved in processes such as metabolism and cellular differentiation. *1987*

reignition
Use ignition

reinforcing materials
Fibers, filaments, fabrics, and other substances used for strengthening of matrices in composite materials. *1980*

Reissner-Nordstrom solution
The unique solution of general relativity theory describing a nonrotating, charged black hole. *1980*

relativistic electron beams
Beams of electrons traveling at approximately the speed of light. Used for REB. *1979*

relativistic particles
Particles with a velocity so large that their relativistic mass exceeds its rest mass by an amount which is significant for the computation or other considerations at hand. *SP-7 1968*

relativistic velocity
A velocity sufficiently high that some properties of a particle of this velocity have values significantly different from those obtaining when the particle is at rest. *SP-7 1968*

relativity
A principle that postulates the equivalence of the description of the universe, in terms of physical laws, by various observers, or for various frames of reference. Used for geometrodynamics and space-time continuum. *SP-7 1968*

relaxation method (mathematics)
An iterative numerical method for solving elliptic partial differential equations, e.g. a Poisson equation. *SP-7 1968*

relaxation time
In general, the time required for a system, object, or fluid to recover to a specified condition or value after disturbance. Specifically, the time taken by an exponentially decaying quantity to decrease in amplitude by a factor of $1/e = 0.3679$. *SP-7 1968*

reliability
Of a piece of equipment or a system, the probability of specified performance for a given period of time when used in the specified manner. *SP-7 1968*

reliability control
Use quality control

relic radiation
Background radiation resulting from the primordial big bang. *1979*

remanence
The magnetic flux density which remains in a magnetic circuit after the removal of an applied magnetomotive force. Also called retentivity. *SP-7 1968*

remote control
Control of an operation from a distance, especially by means of electricity or electronics; a controlling switch, lever, or other device used in this kind of control. Used for electromagnetic control. *SP-7 1968*

remote manipulator system
Devices used in space for deploying and retrieving payloads by remote control; also used for space maintenance and/or servicing of satellites and other spacecraft. *1979*

remote sensing
The sensing of remote phenomena by whatever means. *1980*

rendezvous
The event of two or more objects meeting with zero relative velocity at a preconceived time and place. The point in space at which such an event takes place, or is to take place. *SP-7 1968*

rene 95
High-strength nickel-base superalloy. *1977*

repulsion
Use force

residential energy
Household energy requirements in residences, apartments, etc. *1980*

residual stress
In structures, any stress in an unloaded body. These stresses arise from local yielding of the material due to machining, welding, quenching or cold working. Used for internal stress. *SP-7 1968*

resin matrix composites
Composite materials utilizing a matrix of filaments and/or fibers of glass, metal, or other material bound with a polymer or resin. *1980*

resistance
In electricity, the factor by which the square of the instantaneous conduction current must be multiplied to obtain the power lost by heat dissipation or other permanent radiation of energy away from the electrical current. In mechanics, the opposition by frictional effects to forces tending to produce motion. Used for conductance and resistance coefficients. *SP-7 1968*

resistance coefficients
Use resistance

resolution
The ability of a film, a lens, a combination of both, or a vidicon system to render barely distinguishable a standard pattern of black and white lines. In radar, the minimum angular separation at the antenna at which two targets can be distinguished (a function of beamwidth); or the minimum range at which two targets at the same azimuth can be seperated (equal to one half the pulse height). Of a gyro, a measure of response to small changes in input; the maximum value of the minimum input change that will cause a detectable change in the output for inputs greater than the threshold, expressed as a percent of one half the input range. Used for resolving power. *SP-7 1968*

resolving power
Use resolution

resonance
The phenomena of amplification of a free wave or oscillation of a system by a forced wave or oscillation of exactly equal period. The forced wave may arise from an impressed force upon the system or from a boundary condition. The growth of the resonant amplitude is characteristically linear in time. Of a system in forced oscillation, the condition which exists when any change, however small, in the frequency of excitation causes a decrease in the response of the system. *SP-7 1968*

resonance fluorescence
The emission of radiation by a gas or vapor as a result of excitation of atoms to a higher energy level by incident photons at the resonance frequency of the gas or vapor. Used for resonance radiation. *1978*

resonance lines
Spectral lines which occur either as absorption or emission lines. Used for dielectronic satellite lines. *1981*

resonance radiation
Use resonance fluorescence

resonant frequencies
Frequencies at which resonance exists. Used for natural frequencies and vibrational frequencies (structural). *SP-7 1968*

resonators
In radio and radar applications, circuits which will resonate at a given frequency, or over a range of frequencies, when properly excited. *SP-7 1968*

respiration
The interchange of gases of living organisms and the gases of the medium in which they live. Used for apnea and inhalation. *SP-7 1968*

responders
Use transponders

responses
Of devices or systems, the motions (or other output) resulting from excitation under specified conditions. *SP-7 1968*

resultants
The sums of two or more vectors. *SP-7 1968*

retarding ion mass spectrometers
Use mass spectrometers

reticles
Systems of lines or wires placed in the focal plane of an optical instrument to serve as a reference. Also called a reticule. *SP-7 1968*

retirement for cause
Procedure, primarily on aircraft, based on fracture mechanics, which allows safe utilizaton of the full life capacities of each component. *1981*

retort processing
One method for converting shale oil into oil similar to petroleum oils. *1979*

retractable landing gear
Use landing gear

retroaction
Use retrothrust

retrofitting
Modification of equipment to incorporate changes made in later production of similar equipment; the changes may be performed in the factory or in the field. *1977*

retroreflection
Reflection wherein the refelected rays return along paths parallel to those of their corresponding incident rays. Also called retroflection. *SP-7 1968*

retroreflectors
Class of optical instruments which cause reflected radiation to return along paths parallel to those of their corresponding incident rays. *1979*

retrorocket engines
Rocket engines fitted on or in spacecraft, satellites, or the like to produce thrust opposed to forward motion. *SP-7 1968*

retrothrust
Thrust used for a braking maneuver; reverse thrust. Used for retroaction. *SP-7 1968*

reverberation
The persistance of sound in an enclosed space, as a result of multiple reflections after the sound source has stopped. The sound that persists in an enclosed space, as a result of repeated reflection or scattering after the source of the sound has stopped. *SP-7 1968*

reverberation chambers
Chambers designed to eliminate outside noise for accurate acoustic measurement. *1987*

reverse field pinch
A method of plasma confinement under investigation as part of the mirror and pinch programs. *1978*

reverse osmosis
The application of pressure to stop or reverse the transport of solvent through a semipermeable membrane separating two solutions of different solute concentration. The applied pressure required to prevent the flow of solvent across a perfectly semipermeable membrane is called the osmotic pressure and is a characteristic of the solution. *1977*

reverse time
Use reaction time

revolution (motion)
Use revolving

revolving
Moving in a path about an axis, usually external to the body accomplishing the motion. Used for revolution (motion). *SP-7 1968*

Reynolds number
A nondimensional parameter representing the ratio of the momentum forces to the viscous forces in fluid flow. (After Osborne Reynolds, 1842-1912, English scientist). Used for critical Reynolds number. *SP-7 1968*

Reynolds stress
In the mathematical treatment of a viscous, imcompressible, homogeneous fluid in turbulent motion, that represents the transfer of momentum due to turbulent fluctuations. *SP-7 1968*

Rhea (astronomy)
A natural satellite of the planet Saturn orbiting at a mean distance of 527,000 kilometers. *1979*

rheocasting
Use of partially solidified metal alloys (fractions solids) fed directly into a casting machine for forming into machine parts. *1980*

rheology
The study of the deformation and flow of matter. *DOE 1968*

rhombic antennas
Antennas composed of long wire radiators comprising the sides of a rhombus. The antenna usually is terminated in an impedance. The sides of the rhombus, the angle between the sides, the elevation, and the termination are proportioned to give the desired directivity. *SP-7 1968*

rhomboids
Parallelograms whose adjacent sides are not equal. *1981*

ribbon parachutes
Parachutes having a canopy consisting of an arrangement of closely spaced tapes. These parachutes have high porosity with attendant stability and slight opening shock. *SP-7 1968*

Richardson number
A nondimensional number arising in the study of shearing flows of a stratified fluid. *SP-7 1968*

Richardson-Dushman equation
Use thermionic emission

rifts
Use geological faults

rigid rotors (plasma physics)
Ensembles of electrons moving in circular or nearly circular orbits at a constant angular frequency. *1982*

RIT engines
Radio frequency ion thrustors which generate thrust by converting electric energy into a reaction force by utilizing an electromagnetic field. Used for radio frequency ion thrustor engines. *1977*

roadway powered vehicles
Surface vehicles utilizing a combination of an electrical power source embedded in a roadway and an inductive coupled power pickup. *1980*

robotics
The study and development of reprogrammable devices that do multifunctional tasks, conventionally done by humans, using manipulative functions and/or sensory feedback. The extension of human capabilities to manipulate, repair, service, construct and/or manufacture in space or on the ground is of primary interest to the aerospace community. *1983*

robustness (mathematics)
Insensitivity of systems to uncontrolled perturbations and independent of changes in environmental parameters as demonstrated mathematically. *1980*

rock intrusions
Vertical tabular bodies of rock that fill fissures in host rocks. Used for dikes (geology). *DOE 1974*

rock mechanics
The theoretical and applied science of the physical behavior of rocks, representing a branch of mechanics concerned with the response of rock to the force fields of its physical environment. *1981*

rocket engines
Reaction engines that contain within themselves, or carry along with themselves, all the substances necessary for their operation or for the consumption or combustion of their fuel, not requiring of any outside substance and hence capable of operation in outer space. Used for interplanetary propulsion. *SP-7 1968*

rocket launchers
Devices for launching rockets. *SP-7 1968*

rocket linings
In solid rockets, the layers of inhibiters applied to the inner surface of the chamber holding the grain. *SP-7 1968*

rocket nozzles
The exhaust nozzles of rockets. *SP-7 1968*

rocket propellants
Agents used for consumption or combustion in rockets and from which the rockets derive their thrust, such as fuels, oxidizers, additives, catalysts or any compounds or mixtures of these. Used for multipropellants. *SP-7 1968*

rocket sondes
Use sounding rockets

rocket thrust
The thrust of a rocket engine usually expressed in pounds. *SP-7 1968*

Rocket vehicles
Vehicles propelled by rocket engines, used to place satellites in orbit, place missiles on target or carry passengers over rails as on rocket sleds. *SP-7 1968*

rockoons
High altitude sounding systems that consist of small solid propellant research rockets carried aloft by a large plastic balloons. *SP-7 1968*

rocks
Naturally formed aggregates of mineral matter occurring in large masses or fragments. Used for stones (rocks). *ASTM (D 653, D-18) 1968*

Roentgen satellite
Use ROSAT mission

roll
The act of rolling; rotational or oscillatory movement of an aircraft or similar body about a longitudinal axis through the body -- called roll for any degree of such rotation. The amount of this movement, i.e., the angle of roll. Used for damping in roll. *SP-7 1968*

rolling moments
Moments that tend to rotate an aircraft, rocket or spacecraft about a longitudinal axis. These moments are considered positive when they tend to depres the starboard side of the body. *SP-7 1968*

ROM devices
Use read-only memory devices

Ronchi test
An improvement on the Foucault knife-edge test for curved mirrors, in which the knife edge is replaced with a transmission grating with 15 to 80 lines per centimeter, and the pinhole source is replaced with a slit or a section of the same grating. *1977*

room temperature
A temperature in the range of 20 to 30 C (68 to 85 F). *ASTM (E-41, E-1) 1968*

root-mean-square errors
In statistics, the square root of the arithmetic mean of the squares of the deviations of the various items from the arithmetic mean of the whole. *SP-7 1968*

ROSAT mission
A West German x ray satellite observatory to be launched aboard a medium class Delta launch vehicle as early as 1990. Its name is an abbreviation of Roentgen-Satellit. Used for Roentgen satellite. 1983

Rossby waves
Use planetary waves

rotary engines
A positive displacement engine consisting of a rotor and stator. The control volume which encloses the working fluid during the thermodynamic cycle moves in a generally circular motion rather than a linear motion as in a piston engine. *1984*

rotating
Use rotation

rotation
The motion of a body about some straight line wherein the particles of the body along the line or its extensions have a zero velocity relative to some reference. The line of stationary particles is called the axis of rotation. Used for rotating, whirl. and whirling. *ASTM (E 556, E-17) 1968*

rotational flow
Use vortices

rotifera
A phylum of multicelluler animals in the subkingdom Eumatazoa. *DOE 1969*

rotor body interactions
Aerodynamic interactions between a helicopter rotor and a body. *1982*

rotor disks
Use turbine wheels

rubber
A material that is capable of recovering from large deformations quickly and forcibly, and can be, or already is modified to a state in which it is essentially insoluable (but can swell) in boiling solvent such as benzene, methyl ethyl ketone, and ethanol-toluene azeotrope. *ASTM (D 1079, D-8) 1968*

Runge-Kutta method
A method for the numerical solution of an ordinary differential equation. *DOE 1968*

rutile
A mineral form of titanium oxide (TiO2) (tetragonal crystallization), but usually produced chemically for use in ceramics and other products. *ASTM (C 242, C-21) 1968*

S

S waves
Waves in an elastic media which cause an element of the medium to change its shape without a change in volume. Mathematically, S waves are ones whose velocity field has zero divergence. Used for secondary waves, shear disturbances, and shear waves. *SP-7 1968*

sabot projectiles
Projectiles having devices fitted around or in back of the projectiles in gun barrels or launching tubes to support or protect the projectiles or to prevent the escape of gas ahead of it. The sabot separates from the projectile after launching. *SP-7 1968*

sabotage
Deliberate destructive action that may be directed against property, processes, systems, organizations, goverments, or people and that is intended to prevent a process, undermine a group, or interfere with progress towards a goal. *1980*

SAGE satellite
Spacecraft for the study of stratospheric aerosols and gases. Used for Stratospheric Aerosol & Gas Experiment. *1979*

Sagnac effect
A phase shift (and consequent measurable rotation rate) caused by nonreciprocity (different optical path lengths) of two counterpropagating light waves traveling in the same coil in a fiber optic gyro or ring interferometer. *1985*

salt beds
Deposits of sodium chloride and other salts resulting from the evaporation and/or precipitation of ancient oceans. *1979*

samples
Physical or biological specimens intended to be representative of the whole. *ASTM (A 1644, A-4) 1968*

sampling
Obtaining of a portion representative of the material concerned. *ASTM (C 998, C-26; D 1129, D-19) 1968*

sand dunes
Use dunes

Sargasso Sea
A region in the Atlantic characterized by mixing ocean currents and a lack of winds. Located northeast of the West Indies. *1980*

SarSat
The US satellite of the COSPAS-SarSat project for the search and rescue of distressed vehicles, administered by USSR, US, French, and Canadian agencies. Used for Search and Rescue Satellite. *1983*

satellite atmospheres
The atmospheres that are found on natural satellites. *1980*

satellite communication
Use of communication satellites, passive reflecting belts of dipoles or needles, or relecting orbiting balloons to extend the range of radio communication by returning signals to earth from the orbiting object, with or without amplification. *1986*

satellite defense
Use spacecraft defense

satellite surfaces
The crust and soil of natural satellites. *1980*

Satellite Tracking and Data Acq Network
Use STDN (network)

satellites
Any objects, man-made or natural, that orbit celestial bodies. *1987*

saturation (chemistry)
The state of a solution when it holds the maximum equilibrium quantity of dissolved matter at a given temperature. *1981*

Saturn atmosphere
The outer shell of gas surrounding the planet Saturn. *1976*

Saturn satellites
The natural satellites of the planet Saturn. *1980*

scalars
Any physical quantity whose field can be described by a single numerical value at each point in space. *SP-7 1968*

scale effect
Any variation in the nature of the flow and in the force coefficients associated with a change in value of the Reynolds number, i.e., caused by change in size without change in shape. *SP-7 1968*

scale height
A measure of the relationship between density and temperature at any point in the atmosphere. *DOE 1968*

scale models
Three-dimensional representations of objects or structures containing all parts in the same proportion as their true size. *DOE 1968*

scalers
Devices that produce output pulses whenever a prescribed number of input pulses have been received. *SP-7 1968*

scanners
Radar mechanisms incorporating such things as rotatable antennas, radiators, motor drives, or mountings for directing a searching radar beam through space and imparting target information to an indicator. Used for scanning devices. *SP-7 1968*

scanning
In radar, the motion of the antenna assembly when searching for targets. *SP-7 1968*

scanning devices
Use scanners

scanning laser acoustic microscope (SLAM)
Use acoustic microscopes

scars (geology)
Use erosion

SCATHA satellite
Satellite for investigating spacecraft charging at high altitudes. A joint NASA-Air Force venture. Used for P78-2 satellite. *1979*

scatter plates (optics)
Holograms of diffusing screens for scattering incident light by the process of diffraction. *1981*

scatter propagation
Specifically, the longrange propagation of radio signals by scattering due to index of refraction inhomogeneities in the lower atmosphere.

scatterers
Use scattering

scattering
The process by which small particles suspended in a medium of a different index of diffraction diffuse a portion of the incident radiation in all directions. In scattering, no energy transformation results, only a change in the spatial distribution of the radiation. Used for scatterers. *SP-7 1968*

scattering coefficients
Measures of the attenuation due to scattering of radiation as it traverses a medium containing scattering particles. *SP-7 1968*

scattering cross sections
The hypothetical areas normal to the incident radiation that would geometrically intercept the total amount of radiation actually scattered by a scattering particle. They are also defined, equivalently, as the cross section areas of isotropic scatterers (spheres) which would scatter the same amount of radiation as the actual amount. *SP-7 1968*

scattering functions
The intensities of scattered radiation in a given direction per lumen of flux incident upon the scattering material. *SP-7 1968*

SCCF
Use solar cell calibration facility

Schach effect
When a slowly or nonrotating satellite is heated on its sunward side, the photons of thermal radiation carry away more momentum from the hot sunward side than the cold shadowed side, thereby giving the satellite a certain net acceleration in the direction away from the sun. This effect was discovered by Milton Schach in the course of an investigation of unknown perturbations in the LAGEOS satellite. *1980*

schist
A strongly foliated crystalline rock formed by dynamic metamorphism which can be readily split into thin flakes or slabs due to the well developed parallelism of more then 50% of the minerals present. *DOE 1969*

schlieren photography
A method of photography for flow patterns that takes advantage of the fact that light passing through a density gradient in a gas is refracted as though it were passing through a prism. *SP-7 1968*

Schuler tuning
Adjusting a system performing the function of a pendulum so that it has a period of 84 minutes. *SP-7 1968*

scintillation
Generic term for rapid variations in apparent position, brightness, or color of a distant luminous object viewed through the atmosphere. A flash of light produced in a phosphor by an ionizing event. On a radar display, a rapid apparent displacement of the target from its mean position. *SP-7 1968*

scintillation counters
The combinations of phosphor, photomultiplier tube, and associated circuits for counting scintillations. Used for scintillators and scintillometers. *SP-7 1968*

scintillators
Use scintillation counters

scintillometers
Use scintillation counters

SCPC transmission
Use single channel per carrier transmission

screw pinch
A cylindrical plasma equilibrium in which the axial and azimuthal components of the vacuum field are of the same size. *1981*

scrubbers
Apparatus used in sampling and in gas cleaning in which the gas is passed through a space containing wetted 'packing' or spray. *ASTM (D 1356, D-22) 1968*

SDV
Use shuttle derived vehicles

sea breeze
A coastal, local wind that blows from sea to land caused by temperature differences when the sea surface is colder than the adjacent land. *1979*

sea keeping
Maintaining the stability of a surface vessel in linear response to wave height, pitch, heave, center of gravity, and bow acceleration. *1979*

sea law
United Nations declaration regarding rights to minerals and other marine resources. *1980*

sea level
The level of the surface of the ocean; especially, the mean level halfway between high and low tide used as a standard in reckoning land elevation or sea depths. *1981*

seamounts
Elevations of the ocean floor rising to about 3000-1000 feet or more with the summit about 1000-6000 feet below sea level. *1980*

Search and Rescue Satellite
Use SarSat

Search for Extraterrestrial Intelligence
Use Project SETI

seat belts
Safety belts that fasten across the lap. *SP-7 1968*

secondary cosmic rays
Secondary emission in the atmosphere stimulated by primary cosmic rays. Used for Moliere formula. *SP-7 1968*

secondary emission
Emission of subatomic particles of photons stimulated by primary radiation; for example, cosmic rays impinging on other particles and causing them, by disruption of their electron configurations or even of their nuclei, to emit particles or photons or both in turn. *SP-7 1968*

secondary waves
Use S waves

Seebeck coefficient
Use Seebeck effect

Seebeck effect
The establishment of an electric potential difference tending to produce a flow of current in a circuit of two dissimilar metals the junctions of which are at different temperatures. Used for Seebeck coefficient. *SP-7 1968*

seismic waves
The disturbance of earth tremors produced by a mechanical disturbance on the surface or underground. Used for electroseismic effect. *DOE 1968*

seismocardiography
The measurement of the high frequency vibrations of the heart. *1968*

seismology
The study of earthquakes, by extension, the structure of the interior of the Earth via both natural and artificially generated seismic signals. *DOE 1968*

selective surfaces
Surfaces, often coated, for which the spectral optical properties, such as reflectance, absorptance, emittance, or transmittance vary significantly with wavelength. Such properties are of interest in solar energy applications. Used for solar selective coatings. *1983*

selenology
That branch of astronomy that treats of the moon, its magnitude, motion, constitution, and the like. Selene is Greek for moon. *SP-7 1968*

self adaptive control systems
Particular types of stability augmentation systems which change the responses of given control inputs by constantly sampling responses and adjusting their gain, rather than having fixed or selective gain systems. *SP-7 1968*

self diffusion (solid state)
The spontaneous movement of an atom to a new site in a crystal of its own species. *1976*

self regulating
Use automatic control

self subtraction holography
Use holographic subtraction

self tests
Programmed functions performed by a machine, either automatically at start-up or on user demand, that test the working order of the of the machine. In particular, programs stored in read-only memory that test the integrity of a machine's integrated circuits and the connections between the circuits and the devices they control. *1986*

semicircular canals
Structures of the inner ear, the primary function of which is to register movement of the body in space. They respond to change in the rate of movement. *SP-7 1968*

semiconductor devices
Electron devices in which the characteristic distinguishing electronic conduction takes place within semiconductors. *SP-7 1968*

semiconductor diodes
Two-electrode semiconductor devices utilizing the rectifying properties of junctions or point contacts. *1977*

semiconductor insulator semiconductors
Use SIS (semiconductors)

semiconductors (materials)
Electronic conductors, with resistivity in the range between metals and insulators, in which the electrical charge carrier concentration increases with increasing temperature over some temperature range. Certain semiconductors possess two types of carriers, namely, negative electrons and positive holes. *SP-7 1968*

senders
Use transmitters

sensibility
Use sensitivity

sensitivity
Response of a mathematical model to variations of the input parameters. Used for insensitivity and sensibility. *DOE 1968*

sensitometry
The measurement of the light response characteristics of photographic film under specified conditions of exposure and development. *SP-7 1975*

sensors
Devices designed to respond to physical stimuli (as temperature, illumination, and motion) and transmit a resulting signal for interpretation, or measurement, or for operating a control. Used for pickoffs and pickups. *ASTM (D 1356, D-22) 1968*

SEOCS (satellite)
An ESA meteorological satellite designed for sun-earth observation and climatology. *1977*

SEPAC (payload)
Space experiment particle accelerators. A Spacelab 1 payload that experiments on the earth's ionosphere and magnetosphere. Used for Space Exper with Particle Accelerators. *1981*

sequential control
Control by completion of a series of one or more events. *SP-7 1968*

series expansion
In mathematics, a divergent series of terms the sum of which is asymptotic or ascending. *1976*

servomechanisms
Control systems incorporating feedback in which one or more of the system signals represent mechanical motion. *SP-7 1968*

SES
Use surface effect ships

SETI
Use Project SETI

Severe Storms Observing Satellite
Use StormSat satellite

sewers
Networks of pipelines for the transportation of metabolic and/or industrial wastes for disposal. *1980*

sextants
Double reflecting instuments for measuring angles, primarily altitudes of celestial bodies. *SP-7 1968*

SFAR
Use sound fixing and ranging

sferics
Use atmospherics

SGEMP
Use system generated electromagnetic pulses

shadowgraph photography
Photography in which steep density gradients in the flow about a a body are made visible, the body itself being presented in silouette. Used for shadowgraphs and spark shadowgraph photography. *SP-7 1968*

shadowgraphs
Use shadowgraph photography

shadows
Darknesses in regions, caused by obstructions between the source of light and the regions. *SP-7 1968*

shape control
The control of large flexible platforms in orbit by means of actuators strategically located. *1980*

shape memory alloys
Martensitic alloys (titanium-nickel) which exhibit shape recovery characteristics by stress-induced transformation and reorientation. Reverse transformation during heating restores the original grain structure of the high temperture phase. *1980*

shatter cones
Distinctively striated conical rock fragments along which fracturing has occurred, ranging in length from less than a centimeter to several meters, and generally found in nested or composite groups in rocks of cryptoexplosion structures and believed to be formed by shock waves generated by meteorite impact. *1979*

shear disturbances
Use S waves

shear fatigue
Use shear stress

shear strain
The tangent of the angular change, due to force, between two lines originally perpendicular to each other through a point in a body. *ASTM (E 6, E-28) 1968*

shear strength
The maximum shear stress which a material is capable of sustaining. Shear strength is calculated from the maximum load during a shear or torsion test and is based on the original dimensions of the cross section of the specimen. *ASTM (E 6, E-28) 1968*

shear stress
The stress component tangential to the plane on which the forces act. Used for shear fatigue and shearing stress. *ASTM (E 6, E-28) 1968*

shear waves
Use S waves

shearing stress
Use shear stress

shellfish
Aquatic invertebrate animals having shells. *1982*

shielding
The arrangment of shields used for any particular circumstance; the use of shields. *SP-7 1968*

ship to shore communication
Communication between a ship at sea and a shore station. *1983*

shiva laser system
High energy multi-arm solid state (Nd doped ED-2 glass) infrared laser system used for laser driven fusion experiments. *1979*

shock (physiology)
Clinical manifestations of circulatory insufficiency, including hypotension, weak pulse, tachycardia, pallor, and diminished urinary output. *1976*

shock absorbers
Devices for the dissipation of energy used to modify the response of a mechanical system to applied shock. *SP-7 1968*

shock diffusers
Use diffusers

shock fronts
Shock waves regarded as the forward surfaces of fluid regions having characteristics different from thos of the region ahead of the wave. The front sides of shock waves. *SP-7 1968*

shock spectra
Plots of the maximum acceleration experienced by single degree of freedom systems as a function of their own natural frequency in response to applied shocks. *SP-7 1968*

shock tubes
Relatively long tubes or pipes in which very brief high speed gas flows are produced by the sudden release of gas at very high pressure into low pressure portions of the tubes; the high speed flows move into the region of low pressure behind shock waves. *SP-7 1968*

shock tunnels
Shock tubes used as wind tunnels. *SP-7 1968*

shock waves
Surfaces or sheets of discontinuity (i.e. abrupt shanges in conditions) set up in a supersonic fields of flow, through which the fluids undergo a finite decrease in velocity accompanied by a marked increase in pressure, density, temperature, and entropy, as occurs, e.g. in supersonic flows about bodies. Used for bow shock waves. *SP-7 1968*

shoran
A precision electronic position fixing system using a pulse transmitter and receiver and two transponder beacons at fixed points. Used for short range navigation. *SP-7 1968*

short circuit currents
The steady value of the input alternating currents that flow when the output direct current terminals are short-circuited and rated line alternating voltage is applied to the line terminals. *1983*

short range navigation
Use shoran

shunts
Use circuits

shutdowns
The processes of decreasing engine thrusts to zero. *SP-7 1968*

shuttle derived vehicles
New configuration resulting from the production and operation of the Space Shuttle. Used for SDV. *1982*

shuttle engineering simulator
Training equipment for crew members in mission operation procedures including various approach maneuvers, braking, final approach, etc. *1980*

shuttle pallet satellites
Reusable pallet type structures designed to be shuttle launched which will act as building blocks for larger platforms. Used for SPAS (ESA platforms). *1982*

SI
Use International System of Units

sialon
Any composition containing silicon, aluminum, oxygen, and nitrogen and usually produced by the high-temperature reactions among the ingredients. *1980*

SID (ionospheric disturbances)
Use sudden ionospheric disturbances

sidereal time
Time based upon the rotation of the earth relative to the vernal equinox. *SP-7 1971*

siderites
A spathic iron ore; an iron carbonate. *DOE 1968*

signal to noise ratios
Ratios which measure the comprehensibility of a data source or transmission link, usually expressed as the root mean square signal amplitude divided by the root mean square noise amplitude. *SP-7 1968*

silica
Use silicon dioxide

silica gel
A colloidal, highly absorbent silica used as a dehumidifying and dehydrating agent, as a catalyst carrier, and sometimes as a catalyst. *1976*

silicon dioxide
The chemically resistant dioxide of silicon. Used for Refrasil (trademark) and silica. *DOE 1968*

silicon solar cells
Use solar cells

silicon-on-insulator semiconductors
Use SOI (semiconductors)

silver hydrogen batteries
Secondary batteries having silver and hydrogen electrodes. They have good energy density and cycle life. *1979*

silviculture
The theory and practice of controlling the establishment, composition, and growth of stands of trees for the harvesting of foliage limbs, and possibly the trees themselves for biomass. *1979*

SIMD (computers)
A type of parallel computer with multiple memories and an arithmetic logic unit for each memory. A single control unit allocates instruction execution according to the memory that holds the required operands. Used for single instruction multiple data stream. *1987*

simple harmonic motion
A motion such that the displacement is a sinusoidal function of time. *SP-7 1968*

simplex method
A finite iterative algorithm used in linear programming whereby successive solutions are obtained and tested for optimality. *1981*

sine waves
Waves which can be expressed as the sine of a linear function of time, or space, or both. Used for sinusoids. *SP-7 1968*

single channel per carrier transmission
Voice and data transmission system for satellite communication featuring the use of a carrier frequency for each channel of communication. Used for SCPC transmission. *1980*

single event upsets
Radiation-induced errors in microelectronic circuits caused when charged particles (usually from the radiation belts or from cosmic rays) lose energy by ionizing the medium through which they pass, leaving behind a wake of electron-hole pairs. *1985*

single instruction multiple data stream
Use SIMD (computers)

single stage to orbit vehicles
Second and third generation (post-Space Shuttle) vehicles studied for earth orbit international space transportation system. *1977*

sinkholes
Circular depressions in a Karst area. Their drainage is subterraneous, their size is measured in meters or tens of meters, and they are commonly funnel shaped. *1981*

sintering
The bonding of adjacent surfaces of particles in a mass of powders, usually metal, by heating. Used for presintering. *SP-7 1968*

sinuses
A term used in anatomical nomenclature to designate a cavity or hollow space. *DOE 1969*

sinusoids
Use sine waves

siphoning
The transfer of a liquid from a high to a lower level by atmospheric pressure forcing it up the shorter leg while the weight of the liquid in the longer leg causes continuous downward flow. *1980*

SIS (semiconductors)
Semiconductor devices consisting of an electrically insulating layer sandwiched between two semiconducting materials. Used for semiconductor insulator semiconductors. *1980*

site selection
Selecting the location for any physical plant (nuclear power, solar house, etc.) while considering the environmental impact, safety, etc. *1980*

size distribution
The study of the size of objects or features and their distribution. *1981*

sky waves
In radio, radio energy that is received after having been reflected by the ionosphere. *SP-7 1968*

skyhook balloons
Large free balloons having plastic envelopes, used especially for constant level meteorological observations at very high altitudes. (Originally a code name for a U.S. Navy project). *SP-7 1968*

slant perception
Use space perception

slewing
Of a gyro, the rotation of the spin axis caused by applying torque about the axis of rotation. In radar, changing the scale on the display. *SP-7 1968*

slides (microscopy)
Rectangular pieces of glass on which objects are mounted for microscopic examination. *1981*

slip flow
Rarefied gas flow in the region between Knudsen numbers 0.01 and 0.1. *1968*

sloshing
Use liquid sloshing

slow neutrons
Use thermal neutrons

sludge
A water-formed sedimentary deposit. *ASTM (D 1129, D-19) 1968*

Small Water Plane Area Twin Hull
Use SWATH (ship)

SMM-A
Use solar maximum mission-A

SMS 1
A meteorological satellite in synchronous orbit over the Atlantic Ocean to give coverage to the Eastern US. It was launched in May 1974 and is no longer operational but still is in orbit. *1977*

SMS 2
Meteorological satellite in synchronous orbit over Honolulu to give coverage to the Western US. It was launched in February 1975 and and is no longer operational but still is in orbit. *1977*

sneak circuit analysis
In electrical or electronic circuits, the detection and/or prevention of 'sneak circuits' -- paths having latent electrical conditions resulting from unapparent stimulus-response relationships which cause unwanted functions or inhibit desired function. *1976*

Sobolev space
A Banach space whose elements are functions defined in a domain in Euclidean space and whose norm measures the size and smoothness of the functions. *1984*

sodar
Sound detecton and ranging. *1980*

sodium sulfates
Sodium compounds containing the -SO4 group. *1977*

sodium sulfur batteries
One of several types of rechargeable batteries under consideration as power sources for electrically actuated vehicles. This battery uses a solid electrolyte as well as a sodium reservoir made of metal. *1978*

SOFAR
Use sound fixing and ranging

soft landing
The act of landing on the surface of a planet or natural satellite without damage to any portion of the vehicle or payload except possibly the landing gear. Used for soft recovery. *SP-7 1968*

soft recovery
Use soft landing

software engineering
The systematic approach to the development, operation, maintenance, and retirement of software. *1984*

software tools
Computer programs that aid in the specification, construction, testing, analysis, management, documentation, and maintenance of other computer programs. *1983*

SOI (semiconductors)
Semiconductor devices consisting of a silicon layer coupled to an electrically insulating layer. Used for silicon-on-insulator semiconductors. *1986*

soil mechanics
Mechanical properties of unconsolidated accumulations of particles produced by the disintegration and chemical decomposition of rocks. *DOE 1969*

solar activity
Any type of variation in the appearance of energy output of the sun. *SP-7 1968*

solar atriums
Open courts within buildings designed for passive solar heating. *1980*

solar azimuth
Use azimuth

solar backscatter UV spectrometer
A spaceborne spectrometer that measures solar UV spectral irradiance incident on the earth and backscattered radiance from the earth and thereby estimates the total atmospheric ozone content of the atmosphere and the attitude distribution of ozone. *1982*

solar blankets
Large, high-temperature, low-mass solar arrays consisting of ultrathin silicon solar cells interconnected, welded, and bonded to flexible substances. *1979*

solar cell calibration facility
One of the spacelab payloads. Used for SCCF. *1980*

solar cells
Photovoltaic cells that convert sunlight into electrical energy. Used for silicon solar cells and wraparound contact solar cells. *SP-7 1968*

solar collectors
Devices designed to absorb incident solar radiation and transfer the energy to a fluid passing through it. Used for solar receivers. *ASTM (E 683, E-44) 1968*

solar constant
The rate at which solar radiation is received outside the earth's atmosphere on a surface normal to the incident radiation and at the earth's mean distance from the sun. *SP-7 1968*

solar cooling
Conversion of solar energy into refrigeration energy. *1977*

solar cosmic rays
Cosmic rays supposedly originating in the sun. *SP-7 1968*

solar diameter
Observable dimension of the sun. *1980*

solar disk
Use sun

solar dynamic power systems
Electric power systems using a solar heated working fluid to drive a turboalternator. Primary applications are for space stations and spacecraft. *1986*

solar eclipses
Obscurations of the light of the sun by the moon. *SP-7 1968*

solar energy
The radiant energy originating from the sun. Approximately 99% of solar energy lies between the wavelengths of 300 to 3,500 nm. *ASTM (E 772,E-44) 1968*

solar faculae
Use faculae

solar houses
Habitable buildings designed with large expanses of glass or other transparent materials to collect solar radiation for heating. *1977*

solar maximum mission
Use of the multimission modular spacecraft for the study of solar particles, emissions, and flares. *1978*

solar maximum mission-A
The solar maximum mission spacecraft. Used for SMM-A. *1979*

solar mesosphere explorer
A satellite whose experiments will provide a comprehensive study of atmospheric ozone and the processes which form and destroy it. *1981*

solar neighborhood
The portion of the Milky Way Galaxy centering around the sun and containing the nearest neighboring stars. *1987*

solar neutrinos
Neutral particles originating from nuclear reactions in the core of the sun. *1977*

solar noise
Use solar radio emission

solar optical telescope
A 1-M class, high resolution solar telescope which NASA plans to operate on the Shuttle Spacelab during the mid and late 1980's. Used for SOT. *1985*

solar oscillations
Irregular oscillations in the solar atmosphere. *1979*

solar parallax
The angle at the sun subtended by the equatorial diameter of the earth. *SP-7 1968*

solar planetary interactions
The interactions and subsequent effects caused by the interactions of solar activity and/or wind with a planet, its magnetic field, its atmosphere, or natural satellites. *1983*

solar plasma (radiation)
Use solar wind

solar ponds (heat storage)
Large, shallow ponds covered with thin, transparent plastic shields and used for collecting and storing solar heat for conversion to electric power. *1977*

solar power satellites
Proposed very large space structures consisting of hundreds of square miles of solar thermal collectors and/or photovoltaic converters constructed or assembled in space. Power would be transmitted to earth in microwave form. *1981*

solar powered aircraft
Aircraft powered by solar energy. *1981*

solar prominences
Filamentlike protuberances from the chromosphere of the sun. Used for filaments (solar physics). *SP-7 1968*

solar radiation
The total electromagnetic radiation emitted by the sun. *SP-7 1968*

solar radio bursts
Sudden increases in the flux from the sun at radio frequencies. *SP-7 1968*

solar radio emission
Radiation at radio frequencies originating from the sun or its corona. Used for solar noise and solar radio waves. *SP-7 1968*

solar radio waves
Use solar radio emission

solar receivers
Use solar collectors

solar selective coatings
Use selective surfaces

solar simulators
Devices which produce thermal energy, equivalent in intensity and spectral distribution to that from the sun, used in testing materials and space vehicles. *SP-7 1968*

solar system
The sun and other celestial bodies within its gravitational influence, including planets, asteroids, satellites, comets, and meteors. *SP-7 1968*

solar thermal electric power plants
The use of solar energy to generate steam for producing electricity. *1982*

solar thermal propulsion
Proposed energy source for spacecraft propulsion by passing hydrogen through a heat exchanger placed at the focal point of a large parabolic dish solar concentrator mirror. *1980*

solar total energy systems
Systems for converting solar energy directly into electrical and thermal energy. *1979*

solar wind
Streams of plasma flowing approximately radially outward from the sun. Used for solar plasma (radiation). *SP-7 1968*

solettas
Orbiting solar mirrors (reflectors). *1980*

solid cryogen cooling
Cooling with solidified cryogenic fluids. *1980*

solid cryogens
Solidified cryogenic fluids. *1980*

solid electrolytes
Single crystals, certain alloys, alkaline metals, and other compact compounds used in galvanic cells (batteries). *1980*

solid propellant combustion
The burning of solid propellants by rapid oxidation and production of expanding gases, heat, and light. *1978*

solid propellant rocket engines
Rocket engines fueled with solid propellants. Such motors consist essentially of a combustion chamber containing the propellant, and a nozzle for the exhaust jet, although they often contain other components, as grids or liners. *SP-7 1968*

solid propellants
Specifically, a rocket propellant in the solid form, usually containing both fuel and oxidizer combined or mixed, and formed into a monolithic (not powdered or granulated) grain. *SP-7 1968*

solid state devices
Devices which utilize the electric, magnetic, and photic properties of the solid materials, e.g., binary magnetic cores or transistors. *SP-7 1968*

Solrad 10 satellite
Use Explorer 44 satellite

solstices
The two points of the ecliptic farthest from the celestial equator; two points on the celestial sphere occupied by the sun at maximum declination. *SP-7 1968*

solvation
The process of swelling, getting, or dissolving of a material by a solvent; for resins, the solvent can be plasticized. *1981*

solvent refined coal
Low-sulfur distillate fuels from coal, plus the byproducts of methane, light hydrocarbons, and naphtha, all useful for making pipeline gas, ethylene, and high-octane unleaded gasoline. *1980*

solvent retention
The occurence of solvent residues in chemical or material end products or intermediates. *1981*

solvents
The liquid part of an aerosol formulation used to disolve solid or other liquid parts. Used for thinners. *ASTM (D 3064, D-10) 1968*

sonar
A method or system, analogous to radar used under water, in which high frequency sound waves are emitted so as to be reflected back from objects, and used to detect the objects of interest. Called asdic by the British. (From SOund, NAvigation, and Ranging.) *SP-7 1968*

sonic booms
Noises created by shock waves that emanate from aircraft or other objects traveling at or above sonic velocity. *SP-7 1968*

sonic flow
Use transonic flow

sonic speed
Use acoustic velocity

sonic waveguides
Use acoustic delay lines

sorbates
Gas taken up by sorbents. *SP-7 1973*

sorbents
The materials which take up gas by sorption. *SP-7 1968*

sorghum
Any of a number of related cereal grasses with sweet juicy stalks cultivated as farm crops for grain, fodder, syrup, etc. *1980*

sorption
The taking up of gas by absorption, adsorption, chemisorption, or any combination of these processes. Used for cryosorption. *SP-7 1968*

SOT
Use solar optical telescope

sound
Use acoustics

sound barrier
Use acoustic velocity

sound fields
Regions containing sound waves. *SP-7 1968*

sound fixing and ranging
A method for acoustically tracking submerged bodies or floats utilizing fixed hydrophones. Used for SFAR and SOFAR. *1982*

sound generators
Transducers which convert electrical, mechanical or other forms of energy into sound. Used for acoustic generators. *SP-7 1968*

sound intensity
In a specified direction at a point, the average rate of sound energy transmitted in the specified direction through a unit area normal to this direction at the point considered. *SP-7 1968*

sound measurement
Use acoustic measurement

sound pressure
At a point, the total instantaneous pressure at that point in the presence of a sound wave minus the static pressure at that point. *SP-7 1968*

sound velocity
Use acoustic velocity

sound waves
Mechanical disturbances advancing with infinite velocity through an elastic medium and consisting of longitudinal displacements of the medium i.e., consisting of compressional and rarefactional displacements parallel to the direction of advance of the disturbance; a longitudinal wave. Sound waves are small amplitude adiabatic oscillations. Used for acoustic radiation and acoustic vibrations. *SP-7 1968*

sounders
Use sounding

sounding
Any penetration of the natural environment for scientific observation usually by sounding rockets or balloons. Used for sounders. *SP-7 1968*

sounding rockets
Rockets designed primarily for routine upper air observation (as opposed to research) in the lower 250,000 feet of the atmosphere, especially that portion inaccessible to balloons, i.e., above 100,000. Used for meteorological rockets and rocket sondes. *SP-7 1968*

southern sky
That portion of the celestial sphere between the celestial equator and the celestial south pole (and generally visible from areas in the earth's southern hemisphere). *1980*

space based radar
Radar systems installed on large space structures. *1980*

space biology
Use exobiology

space capsules
Containers used for carrying out experiments in space. Used for capsules (spacecraft). *SP-7 1968*

space charge
The electric charge carries by a cloud or stream of electrons or ions in a vacuum or a region of low gas pressure when the charge is sufficient to produce local changes in the potential distribution. The net electric charge within a given volume. *SP-7 1968*

space commercialization
For profit activities in space or prefatory to space activity. *1984*

space cooling (buildings)
The cooling of buildings with a solar energy system which incorporates water chillers controlled by thermostats and other devices to provide a comfortable living environment. *1980*

Space Exper with Particle Accelerators
Use SEPAC (payload)

space heating (buildings)
Heating of living areas for the comfort of occupants (human and/or animal) by any means (electricity, fuels, solar radiation, etc.). *1979*

space observations (from earth)
Surveillance of extraterrestrial phenomena from the earth's surface. *1980*

space operations center (NASA)
A proposed NASA space station to be assembled in space that is designed for conducting space based operations such as satellite servicing, orbit transfer vehicle launch and recovery, and assembly of large space structures. Onboard capabilities could include space manufacturing and research experiments. When fully assembled it will be larger in size than the Space Shuttle. *1983*

space perception
The ability to estimate depth or distance between points in the field of vision. Used for depth perception, distance perception, form perception, and slant perception. *SP-7 1968*

space plasmas
Concentrations of free electrons and protons in the ionosphere, plasmasphere, and beyond. *1980*

space platforms
Gimbal-mounted platforms equipped with gyros and accelerometers for maintaining a desired orientation in inertial space independent of spacecraft motion. *1980*

space processing
Forming and fabrication techniques aboard a spacecraft in a weightless or low-gravity environment and involving improved chemical and/or physical procedures for the creation of new or better products. *1976*

space processing applications rocket
Sounding rocket used for space processing experiments by NASA. Used for SPAR (rocket). *1977*

space radiation
Use extraterrestrial radiation

Space Shuttle ascent stage
Shuttle take-off configuration comprising the orbiter, solid rocket boosters, and external tank. *1980*

Space Shuttle main engine
Liquid propellant propulsion system using fuel drawn from external tanks to provide power for the orbiter to attain orbital speed. *1979*

Space Shuttle orbital flight tests
Use space transportation system flights

Space Shuttle orbital flights
Use space transportation system flights

Space Shuttle upper stage A
A version of a spinning solid upper stage centered around an Atlas Centaur launch vehicle. Used for SSUS-A. *1977*

Space Shuttle upper stage D
A version of a spinning solid upper stage centered around a Delta launch vehicle. Used for SSUS-D. *1977*

Space Shuttle upper stages
A collective term for the various types of upper stages planned for the Space Shuttle. *1977*

space simulators
Devices used to simulate one of more parameters of the space environment used for testing space systems or components. Specifically, a closed chamber capable of approximating the vacuum and normal environments of space. Used for orbital simulators. *SP-7 1968*

space suits
Pressure suits for wear in space or at very low ambient pressures within the atmosphere, designed to permit the wearer to leave the protection of a pressurized cabin. *SP-7 1968*

space transportation system
A joint NASA-DOD advanced space transportation concept for the 1980's. The main element of the STS is the Space Shuttle. Another element is the orbit transfer vehicles-OTV. A third element called Spacelab is designed and manufactured by the European Space Agency, has no propulsive capability and is carried by the Space Shuttle. Used for STS. *1977*

space transportation system flights
Revised collective designation for all Space Shuttle flights. Used for OFT, orbital flight tests (shuttle), space shuttle orbital flight tests, and space shuttle orbital flights. *1979*

space vehicles
Use spacecraft

space-time continuum
Use relativity

spaceborne experiments
A collective term designating the various experiments performed or planned in orbiting spacecraft and usually involving physical phenomena in space environments. *1977*

spacecraft
Devices, manned and unmanned, which are designed to be placed into an orbit about the earth or into a trajectory to another celestial body. Used for space vehicles. *SP-7 1968*

spacecraft charging
Electric charge induction upon the surface of a spacecraft by magnetospheric plasmas or other ion sources. *1977*

spacecraft defense
The protection of spacecraft from undesirable external forces. Used for satellite defense. *1982*

spacecraft docking
The act of coupling two or more orbiting objects; the operation of mechanically connecting together, or in some manner bring together orbital payloads. Used for docking. *SP-7 1968*

spacecraft survivability
The ability of a spacecraft to survive adverse conditions including reentry problems. *1982*

Spacecraft Tracking and Data Network
Use STDN (network)

Spacelab payloads
A general, collective term for the diverse and numerous ESA payloads planned for space experiments. *1976*

Spacelab UV-Optical Telescope Facility
Use Starlab

spacetennas
The transmitting antennas of a solar power satellite transmission system which directs the high-power beam from space to a focus on the rectennas on earth. *1980*

spanloader aircraft
Advanced distributed-load cargo aircraft configurations in which the payloads are distributed across the span of the wing for a close match between aerodynamic and inertial loading for minimal bending stresses. *1978*

SPAR (rocket)
Use space processing applications rocket

spark shadowgraph photography
Use shadowgraph photography

SPAS (ESA platforms)
Use shuttle pallet satellites

spatial isotropy
Use isotropy

spatial marching
Techniques for solving partial differential equations that move along in a space direction. *1981*

spatial orientation
Use attitude (inclination)

spatial resolution
The precision with which an optical instrument can produce separable images of different points on an object. *1980*

specific heat
The ratio of the heat absorbed (or released) by unit mass of a system to the corresponding temperature rise (or fall). Used for Debye temperature and heat capacity. *SP-7 1968*

specifications
Precise statements of sets of requirements to be satisfied by materials, products, systems, or services. *ASTM (E 631, E-6) 1968*

speckle holography
An imaging technique whereby a speckle pattern results from laser illumination of a diffusely reflecting surface when interference occurs between the fields passing through the various portions of lens aperture. Information about the motion of an object can then be obtained from the imaged fringes resulting from the translation of two speckle patterns. *1987*

speckle interferometry
An imaging process whereby the pattern on the image plane of an interferometer is the result of interference between two mutually coherent, but randomly speckled, fields of two, lens formed images from laser illuminated, diffusely reflecting surfaces. *1987*

spectral absorption
Use absorption spectra

spectral lines
Use line spectra

spectral noise
Use white noise

spectral reflectance
The ratio of the reflected flux to the spectrally homogeneous incident flux. *ASTM (E 284, E-12) 1968*

spectral sensitivity
In electronics, radiant sensitivity considered as a function of wavelength, or in physics, the response of a device or material to monochromatic light as a function of wavelength; also known as spectral response. *1977*

spectral shift control
Type of reactor moderator control in which the neutron spectrum is intentionally changed. *1978*

spectroheliographs
Instruments for taking photographs (spectroheliograms) of the image of the sun in monochromatic light. The wavelength of light chosen for this purpose corresponds to one of the Fraunhofer lines, usually the light of hydrogen or ionized calcium. Used for heliographs, heliography, and spectrohelioscopes. *SP-7 1968*

spectrohelioscopes
Use spectroheliographs

spectrophotovoltaics
The enhancement of solar cell productivity by concentrating and subdividing the sunlight spectrum and focusing on specific spectrum efficient solar cells. *1983*

spectropolarimeters
Use polarimeters

specular reflection
Reflection in which the reflected radiation is not diffused; reflection as from a mirror. *SP-7 1968*

speech baseband compression
Technique for reducing the bandwidth required to represent the human voice waveform. *1980*

speed
Use velocity

spent fuels
Nuclear reactor fuels irradiated to the extent that they no longer can effectively sustain a chain reaction. *1980*

sphalerite
Use zincblende

spherical coordinates
A system of curvilinear coordinates in which the position of a point in space is designated by its distance from the origin or pole (the radius vector), the angle phi between the radius vector and a vertically directed polar axis (the cone angle or coaltitude) and the angle theta between the plane of the phi and a fixed meridian plane through the polar axis (the polar angle or longitude). Used for curvilinear coordinates. *1980*

spherical plasmas
Confined circular plasmas. *1980*

spheroids
Ellipsoids; figure resembling spheres. *SP-7 1968*

Spheromaks
Toroidal fusion reactors. *1980*

spicules
Bright spikes extending into the chromosome of the sun from below. *SP-7 1968*

spin glass
A magnetic alloy in which the concentration of magnetic atoms is such that below a certain temperature their magnetic moments are no longer able to fluctuate thermally in time but are still directed at random in loose analogy to the atoms of ordinary glass. *1981*

spin stabilization
Directional stability of a spacecraft obtained by the action of gyroscopic forces which result from spinning the body about its axis of symmetry. *SP-7 1968*

spinning solid upper stage
Space shuttle upper stage designed for launching of satellites not requiring the full capacity of the interim upper stage; does not requires inertial guidance system nor three-axis stabilization; can handle payloads of the class now launched by Delta or Atlas/Centaur. *1977*

splits (geology)
Use geological faults

spoilers
Plates, series of plates, combs, tubes, bars, or other devices that project into the airstream about bodies to break up or spoil the smoothness of the flow, especially such devices that project from the upper surface of an airfoil, giving increased drag and decreased lift. *SP-7 1968*

spores
The reproductive elements of the lower forms of living organisms, usually unicellular. *SP-7 1968*

SPOT (French satellite)
French satellite with high visible resolution for observations of the earth. It was launched in February 1986. The acronym is derived from the French, satellite pour observation de le terre. *1980*

spread reflection
Reflection of electromagnetic radiation from a rough surface with large irregularities. Also know as mixed reflection. *1976*

spread spectrum transmission
Communications technique with many different signal waveforms transmitted in a wide band; power is spread thinly over the band so that narrow-band radios can operate within the band without interference. *1977*

spring (season)
The season of the year between winter and summer. Its beginning is the vernal equinox and its end the summer solstice. *1983*

sputtering
Dislocation of surface atoms of a material from bombardment of high energy atomic particles. *SP-7 1968*

squama
A scale or structure resembling a scale. *1981*

square waves
Oscillations, the amplitudes of which show periodic discontinuities between two values, remaining constant between jumps. Specifically, in radar pulses initiated by a rapid rise to peak power, maintained at a constant peak power over the finite pulse length, and terminated by rapid decrease from peak power. *SP-7 1968*

square wells
The impurity potential areas which bound an electron or hole in semiconducting crystals such as silicon. *1980*

squeeze films
Thin viscoelastic fluid films squeezed between two usually planar structures to serve as sealants, load dampers, lubricants, etc. *1979*

squeezed states (quantum theory)
Single mode minimum uncertainty states for which the fluctuations in one quadrature phase of the field are smaller than would occur for a coherent state. Used for two photon coherent states. *1986*

squibs
Various small explosive devices. Explosive devices used in the ignition of a rocket. Used for XM-6 squib and XM-8 squib. *SP-7 1968*

squid (detectors)
Superconducting quantum interference device magnetometers. Used for superconducting quantum interferometers. *1978*

SSUS-A
Use Space Shuttle upper stage A

SSUS-D
Use Space Shuttle upper stage D

stability
The property of a body, as an aircraft or rocket, to maintain its attitude or to resist displacement, and, if displaced to develop forces and moments tending to restore the original condition. Of a fuel, the capability of a fuel to retain its characteristics in an adverse environment, e.g. extreme temperature. Used for instability. *SP-7 1968*

stability augmentation
Maintenance of aircraft stability in flight by means of automatic control devices which supplement a pilot's manipulation of the aircraft controls. The automatic controls are used to modify inherent aircraft handling problems. *1976*

STADAN (satellite tracking network)
Use STDN (network)

stadimeters
Instruments for determining the distance to an object of known dimension by measuring the angle subtended at the observer by the object. The instrument is graduated directly in distance. *SP-7 1968*

stagnation point
Point in a field of flow about a body where the fluid particles have zero velocity with respect to the body. Used for stagnation region. *DOE 1968*

stagnation region
Use stagnation point

standard deviation
A measure of the agreement between test results. *ASTM (D 3051, D-24) 1968*

standardization
The act or process of reducing something to, or comparing it with, a standard. A measure of uniformity. A special case of calibration whereby a known input is applied to a device or system for the purpose of verifying the output of adjusting the output to a desired level or scale factor. *SP-7 1968*

standards
References used as a basis for comparison or callibration. Concepts that have been established by authority, custom, or agreement to serve as models or rules in the measurement of quantity of the establishment of a practice or a procedure. Used for references (standards). *ASTM (E 268, E-7) 1968*

standing waves
Periodic waves having fixed distribution in space which are the result of interference of progressive waves of the same frequency and kind. Such waves are characterized by the existence of nodes or partial nodes and antinodes that are fixed in space. *SP-7 1968*

star clusters
Groups of stars physically close together. *SP-7 1968*

star formation
The collapse under gravity of molecular clouds of interstellar matter to form clusters of protostars, and the continuing collapse of the protostars to form main-sequence stars. *1986*

star formation rate
The rate at which stars are formed within a specified region or galaxy; sometimes expressed as the number of solar masses per year. *1987*

star trackers
Telescopic instruments on rockets or other flight borne vehicles that lock onto a celestial body and give guidance reference to the vehicles during flight. Used for star tracking. *SP-7 1968*

star tracking
Use star trackers

Stark effect
The broadening or splitting of a spectral line observed when a luminous gas is acted upon by a strong electric field. *SP-7 1968*

Starlab
A proposed satellite ultraviolet telescope that was a joint project between the United States, Canada, and Australia. It is currently in abeyance. Used for Spacelab UV-Optical Telescope Facility. *1979*

stars
Self luminous celestial bodies exclusive of nebulas, comets, and meteors; suns seen in the heavens. Distinguished from planets or natural satellites that shine by reflected light. *SP-7 1968*

Starsat telescope
An anastigmatic 3-mirror reflecting telescope for ultraviolet astronomy purposes aboard the Starsat satellite. *1979*

starspots
Temporary disturbed areas in the stellar photosphere that appear dark because they are colder than the surrounding areas. *1981*

state equations
Use equations of state

static firing
The firing of a rocket engine in a hold down position to measure thrust and accomplish other tests. *SP-7 1968*

static models
Sets of equations of physical laws to determine a balance of systems at rest. *1982*

stationary orbits
Orbits in which the satellite revolves about the primary at the angular rate at which the primary rotates on its axis. From the primary, the satellite thus appears to be stationary over a point on the primary. *SP-7 1968*

stationkeeping
The sequence of maneuvers that maintains a vehicle in predetermined orbit. *SP-7 1968*

stators
In machinery, parts or assemblies that remain stationary with respect to rotating or moving parts or assemblies such as the field frames of electric motors or generators, or the stationary casings and blades surrounding axial flow compressor rotors or turbine wheels; sator blades. *SP-7 1968*

STDN (network)
Spaceflight Tracking and Data Network. Name changed from Space Tracking and Data Acquisition Network (STDAN). Used for Satellite Tracking and Data Acq Network, Spacecraft Tracking and Data Network, and STADAN (satellite tracking network). *1978*

steady state
The condition of a substance or system whose local physical and chemical properties do not vary with time. *SP-7 1970*

steady state flow
Use equilibrium flow

steep gradient aircraft
Use V/STOL aircraft

steerable antennas
Directional antennas whose major lobe can be readily shifted in direction. *SP-7 1968*

steering rockets
Use control rockets

Stefan-Boltzmann law
One of the radiation laws which states that the amount of energy radiated per unit time from a unit surface area of an ideal black body is proportional to the fourth power of the absolute temperature of the black body. *SP-7 1968*

stellar (star tracker)
Use CCD star tracker

stellar activity
A general term encompassing stellar phenomena such as stellar flares, starspot activity, magnetic activity, nuclear fusion, etc. *1984*

stellar color
The particular wavelengths of optical radiation emitted by a star. *1982*

stellar cores
The central portion of the interior of stars. *1984*

stellar coronas
Ionized regions about stars formed by x rays emitted during stellar flares. First discovery of a stellar corona was made aboard the Dutch ANS satellite (1975) when permanent x ray emission from the star SIRIUS was detected and measured. *1977*

stellar Doppler shift
Use Doppler effect
extraterrestrial radiation

stellar flares
Ejections of material from stars in eruptions that last from a few minutes to an hour or more. *1981*

stellar interiors
The subsurface portions of stars. *1987*

stellar magnitude
The measure of the relative brightness of a star. Stellar magnitudes are expressed in a variety of ways, according to the method or process of observation or determination. *1976*

stellar mass accretion
Process by which a star accumulates matter as it moves through dense clouds of interstellar gas. *1977*

stellar oscillations
Irregular fluctuations of the stellar atmospheres. *1980*

stellar parallax
The subtended angle at a star formed by the mean radius of the earth's orbit; it indicates distance to a star. *1980*

stellar physics
A term that encompasses the physical properties of stars, such as luminosity, size, mass, density, temperature, chemical composition, evolution, activity, etc. *1985*

stellar systems
Gravitationally bound groups of stars. SN (Excludes planetary systems). *1987*

stellarators
Experimental thermonuclear devices where containment in a magnetic field is achieved by closing the field upon itself and thus allowing the particles to perform endless spiral motion. *SP-7 1968*

step faults
Use geological faults

step recovery diodes
Varactors in which forward voltage injects carriers across the junction, but before the carriers can combine, the voltage reverses and carriers return to their origin in a group. The result is an abrupt cessation of reverse current and a harmonic rich waveform. *1979*

stepping motors
Motors whose rotations are in short and essentially uniform angular movements rather than a continuous motion. *1980*

stereochemistry
Chemistry dealing with the arrangement of atoms and molecules in three dimensions. *SP-7 1968*

stereophonics
The use of two sound channels to mimic normal hearing. Stereophonic satellite broadcasting has now been developed. *1982*

sterns
Use afterbodies

stiffness
The ratio of change of force (or torque) to the corresponding change in translational (or rotational) displacement of an elestic element. *SP-7 1968*

Stirling cycle
A theoretical heat engine cycle in which heat is added at constant volume, followed by isothermal expansion with heat addition. The heat is then rejected at constant volume, followed by isothermal compression with heat rejection. *SP-7 1968*

stishovite
A mineral consisting essentially of silicon trioxide. *DOE 1971*

stochastic processes
Ordered sets of observations in one of more dimensions, each being considered as a sample of one item from a probability distribution. Used for Poisson process. *SP-7 1968*

stones (rocks)
Use rocks

StormSat satellite
A synchronous earth-pointing satellite for severe storms studies. Used for Severe Storms Observing Satellite. *1977*

strain fatigue
Use fatigue (materials)

strain gages
Instruments used to measure the strain of distortion in a member or test specimen (such as a structural part) subjected to a force. *SP-7 1968*

strange attractors
Abstract geometrical objects in theoretical physics that represent motion which is bounded but not periodic. Their detailed behavior is sensitive to external perturbations, but their overall qualitative behavior is stable. They are of particular interestin the study of turbulence. *1983*

strategic materials
Critical raw materials whose foreign source of supply is uncertain and subject to potential cutoff. Examples of such materials are chromium, cobalt, manganese, and platinum group metals. *1983*

stratigraphy
That branch of geology which treats of the formation, composition, sequence, and correlation of the stratified rocks as part of the earth's crust. *DOE 1968*

stratosphere radiation
Any infrared radiation involved in the complex infrared exchange continually proceeding within the stratosphere. *SP-7 1968*

Stratospheric Aerosol & Gas Experiment
Use SAGE satellite

streak cameras
Cameras for measuring radiation pulses by deflection of an electron beam. *DOE 1977*

streak photography
The process of taking a time exposure photograph of a tracer particle in a fluid; the photograph reveals the motion of each tracer particle in the form of a streak which may be interpreted as a velocity vector. *1977*

streamline flow
Use laminar flow

streams
Bodies of flowing water, great or small, contained within channels as well as uncontained fluids such as air. *DOE 1968*

stress (biology)
The effect of a physiological, psychological, or mental load on a biological organism which causes fatigue and tends to degrade proficiency. *SP-7 1968*

stress concentration
In structures, a localized area of high stress. *SP-7 1968*

stress cycles
A variation of stress with time, repeated periodically and identically. *SP-7 1968*

stress intensity factors
Load-induced variables in tension, compression, and/or shear which are conducive to crack initiation and propagation and fatigue fracture in materials. *1980*

stress ratio
The ratio of the minimum stress to the maximum stress occuring in one stress cycle. *SP-7 1968*

stress relaxation
The decrease in stress after a given time at constant strain.
ASTM (D 1566, D-11) 1968

stress tensors
Complete sets of stress components in a solid or fluid medium.
SP-7 1968

stress-strain relationships
Relationship between the stress or load on a structure, structural member, or a specimen, and the strain or deformation that follows. *1977*

stresses
The forces per unit area of a body that tends to produce a deformation. *SP-7 1968*

striation
A fracture surface marking consisting of a separation of the advancing crack front into separate fracture planes.
ASTM (C 162, C-14) 1968

stringers
Slender, lightweight, lengthwise fill-in structural members in a rocket body, or the like, serving to reinforce and give shape to the skin.
SP-7 1968

strong interactions (field theory)
One of the fundamental interactions of elementary particles, primarily responsible for nuclear forces and other interactions among hadrons. *1981*

strongly coupled plasmas
Highly compressed and collisional plasmas with electron densities of order 10 to the 24th power per cubic centimeter or more. The mean kinetic and potential energies of particles in the plasma are typically of the same order of magnitude. *1981*

Strouhal number
A nondimensional number occuring in the study of periodic or quasiperiodic variations in the wake of objects immersed in a fluid stream. *SP-7 1968*

structural fatigue
Use fatigue (materials)

STS
Use space transportation system

subassemblies
Assemblies that are component parts of larger assemblies. Used for subcircuits. *SP-7 1968*

subcarrier waves
Use carrier waves

subcircuits
Use circuits
subassemblies

subduction (geology)
Descent of one tectonic unit under another. Most commonly used for descent of a slab of lithosphere, but appropriate at any scale.
1985

subgiant stars
Celestial bodies whose position on the Hertzsprung-Russell (H-R) diagram is intermediate between that of the main-sequence stars and normal giants of the same spectral type. *1980*

subgravity
Use reduced gravity

sublimation
The transition of a substance directly from the solid state to the vapor state, or vice versa, without passing through the intermediate liquid state. *SP-7 1968*

submarines
Any self-powered underwater craft or towed underwater barges and arrays. *DOE 1968*

subroutines
A set of instructions necessary to direct a computer to carry out a well defined mathmatical or logical operation; a subunit of a routine, usually coded in such a manner that it can be treated as a black box by the routine using it. *SP-7 1968*

subsonic flow
Flow of a fluid, as air over an airfoil, at speeds less than acoustic velocity. *SP-7 1968*

sudden ionospheric disturbances
Complex combinations of sudden changes in the conditions of the ionosphere and the effects of these changes. Used for geomagnetic crotchets and SID (ionospheric disturbances).
SP-7 1968

sulfation
The introduction into an organic molecule of the sulfuric ester group (or its salts) -O-SO3H, where the sulfur is linked through an oxygen atom to the parent molecule. *ASTM (D 459, D-12) 1968*

sulfidation
The reaction of a metal or alloy with a sulfur-containing species to produce a sulfur compound that forms on or beneath the surface of the metal or alloy. *ASTM (G 15, G-1) 1968*

sun
The star at the center of the solar system, around which the planets, planetoids, and comets revolve. It is a G-type star. Used for solar disk. *SP-7 1968*

sunflowers
Any of a number of tall related plants having yellow, daisylike flowers with yellow, brown, purple, or almost black disks containing seeds from which an oil is extracted. *1980*

sunrise
The crossing of the visible horizon by the upper limb of the ascending sun. *SP-7 1968*

sunset
The crossing of the visible horizon by the upper limb of the descending sun. *SP-7 1968*

sunspot cycle
A cycle with an average length of 11.1 years but varying between 7 and 17 years in the number and area of sunspots, as given by the relative sunspot number. This number rises from a minimum of 0 to 10 to a maximum of 50 to 140 about 4 years later, and then declines more slowly. *SP-7 1968*

sunspots
Relatively dark areas on the surface of the sun consisting of dark central umbras surrounded by penumbras which are intermediate in brightness between the umbras and the surrounding photosphere. *SP-7 1968*

superalloys
Use heat resistant alloys

supercomputers
Computers with very large capacity and very high speed. *1982*

superconducting quantum interferometers
Use squid (detectors)

superconductivity
A property of many elements, alloys, and compounds by virtue of which their electrical resistivity vanishes and they become strongly diamagnetic under appropriate conditions. Used for Meissner effect. *ASTM (B 713, B-1) 1968*

superconductors
Materials that exhibit superconductivity under appropriate conditions. *ASTM (B 713, B-1) 1968*

superhybrid materials
Composites of polymers, boron-aluminum, and titanium. *1979*

superlattices
Crystals grown by depositing semiconductors in layers whose thickness is measured in atoms. *1984*

supermassive stars
Stars with masses exceeding about 50 times that of the sun. *1976*

superpressure balloons
Meteorological balloons consisting of nonextensible envelopes designed to withstand higher internal pressure differentials than external ones. Such balloons will maintain constant elevations until sufficient gas diffuses from them to cause a change in buoyancy. Used for constant volume balloons and tetroons. *1978*

superrotation
The generally more rapid relative motions found in the very tenuous regions of the atmosphere at heights around 300 km. The density of the atmosphere decreases rapidly with height and more than 95% of the mass of the atmosphere is contained within the troposphere and lower stratosphere. These regions of the atmosphere rotate faster on average than the underlying solid earth. *1981*

supersonic compressors
Compressors in which supersonic velocity is imparted to the fluid relative to the rotor blades, the stator blades, or to both the rotor and the stator blades, producing oblique shock waves over the blades to obtain a high pressure rise. *SP-7 1968*

supersonic diffusers
Diffusers designed to reduce the velocity and increase the pressure of fluid moving at supersonic velocities. *SP-7 1968*

supersonic flow
In aerodynamics, flow of a fluid over a body at speeds greater than the acoustic velocity and in which the shock waves start at the surface of the body. *SP-7 1968*

supersonic nozzles
Converging diverging nozzles designed to accelerate a fluid to supersonic speed. *SP-7 1968*

supersonics
Specifically, the study of aerodynamics of supersonic speeds. *SP-7 1968*

surface effect ships
Vessels using ground effect principle and having submerged rigid sidewalls (sealants). Used for SES. *1978*

surface pressure
Use pressure

surface tension
Use interfacial tension

surface-active agents
Use surfactants

surfactants
A material that improves the emulsifying, dispersing, wetting, or other surface-modifying properties of liquids. Used for surface-active agents. *ASTM (E 609, E-35) 1968*

surges
Transient rises in power or pressure such as a brief rise in the discharge pressure of a rotary compressor. Used for transients (surges). *SP-7 1968*

suspensions
A two-phase system consisting of a finely divided solid dispersed in a solid, liquid, or gas. *ASTM (E 609, E-35) 1968*

sustainer rocket engines
Rocket engines that maintain the velocity of the rocket once it has achieved its programmed velocity by use of boosters or other engines. *SP-7 1968*

swamps
Use marshlands

SWATH (ship)
Small water plane area twin hull concept extension of hydrofoils for improving seaworthiness and speed. Used for Small Water Plane Area Twin Hull. *1978*

swath width
The width of the area covered by an imaging sensor determined by the geometry of the instrument. *1983*

sweat cooling
A process by which a body having a porous surface is cooled by forced flow of coolant through the surface from the interior. Used for transpiration cooling. *SP-7 1968*

symbiosis
The intimate living together of two organisms of different species, for mutual benefit. *DOE 1969*

symmetry breaking
Use broken symmetry

synchronism
The relationship between two or more periodic quantities of the same frequency when the phase difference between them is zero or constant at a predetermined value. Used for beat and synchronization. *SP-7 1968*

synchronization
Use synchronism

synchronous detectors
Use correlators

synchronous platforms
Space platforms whose rotation is synchronized with that of earth. Used for geostationary platforms. *1981*

synchronous satellites
Equatorial west-to-east satellites orbiting the earth at an altitude of approximately 35,900 kilometers at which altitude they makes one revolution in 24 hours, synchronous with the earth's rotation. Used for geostationary satellites. *SP-7 1968*

synchrotrons
Devices for accelerating particles, ordinarily electrons, in a circular orbit in an increasing magnetic field by means of an alternating field applied in a synchronism with the orbital motion. *SP-7 1968*

syncom 4 satellite
A geosynchronous communications satellite that was deployed on Space Shuttle STS 51A in November 1984. *1979*

synoptic meteorology
The study and analysis of weather information gathered at the same time. *SP-7 1968*

syntectic alloys
Metallic composite materials characterized by a reversible convertibility of their solid phases into two liquid phases by the application of heat. *1980*

synthesis (chemistry)
The application of chemical reactions to obtain desired chemical products. *1980*

synthetic aperture radar
Active microwave sensors providing all-weather, high resolution imagery. Used for imaging radar. *1978*

synthetic apertures
In radar technology, the simulations of large antennas by correcting the phase and magnitude of the return signals from smaller antennas, permitting the use of lower frequencies for airborne radars. *1979*

synthetic food
Mixture of roughage, vitamins, minerals, etc. closely approximating natural foods in appearance, taste, and nutrition. *1980*

synthetic metals
Materials which do not occur in nature but have the appearance and physical properties of true metals. *1981*

syntony
The situation of two or more oscillationg circuits having the same resonant frequency. *SP-7 1981*

system generated electromagnetic pulses
Electromagnetic fields generated by the emission of a large electronic current from a metallic body in space caused by the incidence on its surface of strong ionizing radiation pulses (usually x ray) from space. Used for SGEMP. *1979*

system identification
The technology of modeling plants and processes from their dynamic response. *1980*

systems integration
The combining of subsystems each with numerous interfaces for the input and output of data and each with specified functions vital to the planned success of the main system. *1980*

systems simulation
The simulation of any dynamic system. *1980*

T

Tacan
A two dimensional navigation system which provides azimuth and distance to a fixed ground station for navigation in piloted aircraft. Used for tactical air navigation. *SP-7 1968*

tactical air navigation
Use Tacan

tail assemblies
The rear part of a body, as of an aircraft or a rocket. The tail surfaces of an aircraft or rocket. Used for empennage, tail mountings, tails (assemblies), and vertical tails. *SP-7 1968*

tail mountings
Use tail assemblies

tails (assemblies)
Use tail assemblies

takeoff
The action of a rocket vehicle departing from its launch pad. The action of an aircraft as it becomes airborne. *SP-7 1968*

TARE (data reduction)
Use data reduction

target acquisition
The process of optically, manually, mechanically, or electronically orienting tracking systems in the direction and range to lock on a target. *SP-7 1968*

target masking
Technique used in vision contrast discrimination testing involving the ratio of the luminance of a target (object) to the luminance of the background, especially when light and dark adaptation are factors. *1976*

target penetration
Use terminal ballistics

targets
Objects or points toward which something is directed. Objects which reflect a sufficient amount of a radiated signal to produce an echo signal on detection equipment. Used for towed targets. *SP-7 1968*

TCV program
Use terminal configured vehicle program

TDMA
Use time division multiple access

tearing modes (plasmas)
Explosive reconnections of energetic particle accelerations at high voltages in the magnetosphere during substorms. *1980*

tectonic movement
Use tectonics

tectonics
A branch of geology dealing with the broad architecture of the upper part of the Earth's crust, that is, the regional assembling of structural or deformational features, a study of their mutual relations, their origin, and their historical evolution. Used for tectonic movement. *DOE 1968*

TED
Use transferred electron devices

Tedlar (trademark)
Use polyvinyl fluoride

tektites
Small glassy bodies containing no cystals, composed of at least 65 percent silicon dioxide, bearing no relation to the geological formations in which they occur, and believed to be of extraterrestrial origin. *SP-7 1968*

teleconnections (meteorology)
Statistically significant temporal correlations between meteorological parameters at widely separated points. *1985*

telemeters
Use telemetry

telemetry
The science of measuring a quantity or quantities, transmitting the results to a distant station, and there interpreting, indicating, and/or recording the quantities measured. Used for telemeters. *SP-7 1968*

telephotometers
Use telephotometry

telephotometry
The body of principles and techniques concerned with measuring atmospheric extinction using various types of telephotometers. Used for telephotometers. *SP-7 1968*

telluric currents
Large scale surges of electric charges within the earth's crust, associated with disturbances of the ionosphere. Used for earth currents. *SP-7 1968*

telluric lines
Absorption lines in a solar spectrum produced by constituents of of the atmosphere of the earth itself rather than by gases in the outer solar atmosphere such as those responsible for the Fraunhofer lines. *SP-7 1968*

Tempel 2 comet
A comet for which a spacecraft rendezvous had been planned for 1988 because of its accessable orbit. It has been replaced by a planned spacecraft rendezvous with the Wild 2 comet in 1994. *1979*

temperature
In general, the intensity of heat as measured on some definite temperature scale by means of any of various types of thermometers. In statistical mechanics, a measure of translational molecular kinetic energy (with three degrees of freedom). In thermodynamics, the integrating factor of the differential equation referred to as the first law of thermodynamics. Used for body temperature (non-biological). *SP-7 1968*

temperature dependence
The characteristic of a material which is dependent on changes in the ambient temperature. *1979*

temporal distribution
The statistical distribution based on time of phenomena, occurences or events. *1981*

temporal resolution
The precision with which an optical instrument or a system differentiates between time intervals. Used for multitemporal analysis. *1980*

tensile strength
The property of solid material that indicates its ability to withstand a uniaxial tensile load. *ASTM (C 709, C-5) 1968*

tensile stress
Normal stress tending to lengthen the body in the direction in which it acts. *ASTM (D 653, D-18) 1968*

tensor fields
Use tensors

tensors
Arrays of functions which obey certain laws of transformation. A one row or one column tensor array is a vector. Used for tensor fields and transformation tensors. *SP-7 1968*

terminal area energy management
Automated guidance and landing system for the Space Shuttle orbiter. *1980*

terminal ballistics
That branch of ballistics dealing with the motion and behavior of projectiles at the termination of their flight, or in striking and penetrating a target. Used for penetration ballistics, projectile penetration, and target penetration. *SP-7 1968*

terminal configured vehicle program
NASA Program for determining configurations for short haul transport aircraft, including V/STOL and VTOL aircraft. Used for TCV program. *1977*

terminal velocity
The maximum velocity attainable, especially by a free falling body, under given conditions. *SP-7 1968*

terpenes
A class of unsaturated organic compounds having the empirical formula C10H15 occuring in most essential oils and oleoresinous plants. Structurally the important terepenes and their derivatives are classified as monocyclic (dipentene), bicylic (pinene), and acyclyic (myrcene). *ASTM (D 804, D-17) 1968*

terrestrial magnetism
Use geomagnetism

terrestrial planets
The four small planets near the sun (Earth, Mercury, Venus, and Mars). *1977*

test chambers
Places, sections, or rooms having special characteristics where a person of object is subjected to experiment, as an altitude chamber. Used for environmental chambers. *SP-7 1968*

test firing
The firing of a rocket engine, either live or static, with the purpose of making controlled observations of the engine or of an engine component. *SP-7 1968*

test pattern generators
Image-processing software. *1980*

test stands
Stationary platforms or tables, together with any testing apparatus attached thereto, for testing or proving engines or instruments. *SP-7 1968*

tethered satellites
Concept for scientific payloads suspended at altitudes of 120 Km from Space Shuttle orbiters flying at 200-Km altitude; control system would permit deployment and retrieval of the tethered satellites. *1977*

Tethys
One of the natural satellites of Saturn orbiting at a mean distance of 295,000 kilometers. *SP-7 1968*

tetraethyl orthosilicate
An oxidation inhibiting coating used on the wing leading edges and nose cap of the Space Shuttle. *1981*

tetrahydrofuran
In organic chemistry, an intermediate and a solvent for polyvinyl chloride. Used for butylene oxides. *1978*

tetroons
Use superpressure balloons

textures
The structural qualities of surfaces determined by the interrelation of their elements. *ASTM (E 284, E-12) 1968*

theodolites
Optical instruments which consist of a sighting telescope, mounted so that it is free to rotate around horizontal and vertical axes, and graduated scales so that the angle of rotation may be measured. The telescope is usually fitted with a right angle prism so that the observer continues to look horizontally into the eyepiece, what ever the variation of the elevation angle. *SP-7 1968*

thermal accommodation coefficients
Use accommodation coefficient

thermal analysis
A general term covering a group of related techniques whereby the the dependance of the parameters of any physical property of a substance on temperature is measured. Used for differential thermal analysis and DTA (analysis). *ASTM (E 473, E-37) 1968*

thermal comfort
That condition which expresses satisfaction with the thermal environment and which is measured by such factors as air temperature, relative humidity, air velocity, etc. *DOE 1968*

thermal conductivity
Time rate of unidirectional heat transfer per unit area, in the steady-state, between parallel planes separated by unit distance, per unit difference of temperature of the planes. *ASTM (D 123, D 1518; D-13) 1968*

thermal decomposition
The breaking apart of complex molecules into simpler units by the application of heat. *1979*

thermal degradation
Impairment of properties caused by exposure to heat. *DOE 1968*

thermal diffusivity
The ratio of thermal conductivity of a substance to the product of its density and specific heat. Common units for this property are sq cm/s or sq ft/h. *ASTM (C 351, C-16) 1968*

thermal efficiency
Use thermodynamic efficiency

thermal emission
The process by which a body emits electromagnetic radiation as a consequence of its temparature only. *SP-7 1968*

thermal expansion
The increase in the dimensions or the volume of a body due to change in temperature. *ASTM (E 7, E-4) 1968*

thermal fatigue
In metals, fracture resulting from the presence of temperature gradients which vary with time in such a manner as to produce cyclic stresses in a structure. *SP-7 1968*

thermal instability
The conditions of temperature gradient, thermal conductivity, and viscosity which lead to the onset of convection in a fluid. *SP-7 1968*

thermal insulation
A material applied to reduce the flow of heat. *ASTM (D 1079, D-8) 1968*

thermal neutrons
Neutrons in thermal equillibrium with the medium in which they exist. Used for slow neutrons. *DOE 1968*

thermal noise
The noise at radiofrequency caused by thermal agitation in a dissipative body. Also called Johnson noise. *SP-7 1968*

thermal pollution
Environmental temperature rise due to waste heat disposal. *DOE 1970*

thermal radiation
The electromagnetic radiation emitted by any substance as the result of the thermal excitation of its molecules. Thermal radiation ranges in wavelength from the longest infrared radiation to the shortest ultraviolet radiation. *SP-7 1968*

thermal resistance
The extent to which a material retains useful properties as measured during exposure of the material to a specified temperature and environment for a specified time. Used for heat resistance. *ASTM (D 123, D 4391, D-13) 1968*

thermal shielding
Use heat shielding

thermal shock
The development of a steep temperature gradient and accompanying high stresses within a structure. *SP-7 1968*

thermal stresses
Stresses in metal, resulting from nonuniform temperature distribution. *SP-7 1968*

thermionic emission
Direct ejection of electrons as the result of heating the material, which raises electron energy beyond the binding energy that holds the electron to the material. Used for Richardson-Dushman equation. *SP-7 1968*

thermionic reactors
Use ion engines
nuclear rocket engines

thermionics
The study of the emission of electrons by heat. *SP-7 1968*

thermistors
Electron devices employing the temperature dependent change of resistivity of a semiconductor. *SP-7 1968*

thermites
Fire-hazardous mixtures of ferric oxide and powdered aluminum; upon ignition with a magnesium ribbon, the mixtures reach temperatures up to 4000 degrees F (sufficient to soften steel). *1980*

thermochemistry
A branch of chemistry that treats the relations of heat and chemical changes. *SP-7 1968*

thermocouples
Devices which convert thermal energy directly into electrical energy. In its basic form it consists of two dissimilar metallic electrical conductors connected in a closed loop. Each junction forms a thermocouple. *SP-7 1968*

thermodynamic efficiency
In thermodynamics, the ratio of the work done by a heat engine to the total heat supplied by the heat source. Used for thermal efficiency. *SP-7 1968*

thermodynamic equilibrium
A very general result from statistical mechanics which states that if a system is in equilibrium, all processes which can exchange energy must be exactly balanced by the reverse process so that there is no net exchange of energy. *SP-7 1968*

thermodynamics
The study of the flow of heat. Used for heat equations, thermomechanics, and thermophysics. *SP-7 1968*

thermoelasticity
Dependence of the stress distribution of an elastic solid on its thermal state, or of its thermal conductivity on the stress distribution. *DOE 1968*

thermography
Technique employing heat transfer transients. *DOE 1968*

thermomechanical treatment
Combination of material-forming processes with heat treatments in order to obtain specific material properties. *DOE 1974*

thermomechanics
Use thermodynamics

thermometers
Devices for measuring temperature. *SP-7 1968*

thermomigration
A technique for doping semiconductors in which exact amounts of known impurities are made to migrate from the cool side of a wafer of pure semiconductor material to the hotter side when the wafer is heated in an oven. *1981*

thermophoresis
A process in which particles migrate in a gas under the influence of forces created by a temperature gradient. *DOE 1985*

thermophysics
Use thermodynamics

thermopiles
Transducers for converting thermal energy directly into electrical energy, composed of pairs of thermocouples which are connected either in series or in parallel. Batteries of thermocouples connected in series to form single compact units. *SP-7 1968*

thermoplastic films
Materials with a linear macromolecular structure that will repeatedly soften when heated and harden when cooled. *1976*

thermoregulation
A mechanism by which mammals and birds balance heat gain and loss in order to maintain a constant body temperature. Used for body temperature regulation. *DOE 1968*

thermotropism
Use anisotropy

thick plates
Plates of steel or other material that are over two inches thick. The exact definition of dimensions that constitute thickness varies. *1981*

thin films
Films having a thickness much smaller than any lateral dimension, formed by deposition of a material or by a thinning process. *ASTM (F 390, F-1) 1968*

thinners
Use solvents

thixotropy
The property of material that enables it to stiffen in a relatively short time on standing, but upon agitation or manipulation to change to a very soft consistency or to a fluid of high viscosity, the process being completely reversible. *ASTM (D 653, D-18) 1968*

threat evaluation
The evaluation of the potential harm of an approaching aircraft or other objects. *1982*

three axis stabilization
Maintenance of a stable platform in a desired 3-axis orientation in inertial space by utilizing gyros and accelerometers and which is independent of vehicle motion. *1976*

three body problem
That problem in classical celestial mechanics which treats the motion of a small body, usually with negligible mass, relative to and under the gravitational influence of two other finite point masses. *SP-7 1968*

threshold shift
Use thresholds

threshold voltage
The threshold energy necessary to remove an electron from the bound position to the conduction band in solid state devices. *1985*

thresholds
Generally, the minimum values of signals that can be detected by the systems or sensors under consideration. Used for threshold shift. *SP-7 1968*

throats
The narrowest portion of a constricted duct, as in a diffuser, or a venturi tube. SN (non biological). *SP-7 1968*

thrust
The pushing or pulling force developed by an aircraft engine or a rocket engine. The force exerted in any direction by a fluid jet or by a powered screw, as, the thrust of an antitorque rotor. Specifically in rocketry, F(thrust) = mv where m is propellant mass flow and v is exhaust velocity relative to the vehicle. Used for thrust power. *SP-7 1968*

thrust augmentation
The increasing of the thrust of an engine or power plant, especially of a jet engine and usually for a short period of time, over the thrust normally developed. *SP-7 1968*

thrust distribution
The location of areas of upward thrust (lift) on wings, airfoils, etc. *1980*

thrust faults
Use geological faults

thrust power
Use thrust

tidal oscillation
Use tides

tides
The periodic rising and falling of the earth's oceans and atmosphere. It results from the gravitational forces of the moon and sun acting upon the rotating earth. The disturbance actually propagates as a wave through the atmosphere and along the surface of the waters of the earth. Atmospheric tides are always so designated, whereas the term tide alone commonly implies the oceanic variety. Used for tidal oscillation. *SP-7 1968*

tiles
Ceramic surfacing units, usually relatively thin in relation to facial area, made from clay or a mixture of clay and other ceramic materials, called the body of the tile having either a 'glazed' or 'unglazed face and fired above red heat in the course of manufacture to a temperature sufficiently high to produce specific physical properties and characteristics. *ASTM (C 242, C-21) 1968*

tilt
Use attitude (inclination)

tilt rotor aircraft
A type of convertible aircraft which takes off, hovers, and lands as a helicopter but is converted into a fixed wing aircraft by the 90-degree tilting of its rotor or rotors for use as a propeller for forward flight. *1976*

tilting
Use attitude (inclination)

tiltmeters
Instruments used to measure small changes in the tilt of the earth's surface usually in relation to a liquid-level surface or to the rest position of a pendulum. *1981*

time
The hour of the day reckoned by the position of a celestial reference point relative to a reference celestial median. Used for duration. *SP-7 1968*

time constant
Generally, the time required for an instrument to indicate a given percentage of the final reading resulting from an input signal; the relaxation time of an instrument. *SP-7 1968*

time delay
Use time lag

time division multiple access
Radio transmission method in which each station of a satellite communication network is assigned a time schedule for transmission (in lieu of frequency division); a multi-element antenna with an adaptive null steering array eliminates interference. Used for TDMA. *1977*

time division multiplexing
A system for the transmission of information about two or more quantities (measurands) over a common channel by dividing available time intervals among the measurands to form a composite pulse train. *SP-7 1968*

time lag
The total time between the application of a signal to a measuring instrument and the full indication of that signal within the uncertainty of the instrument. Used for chronotrons, lag (delay), and time delay. *SP-7 1968*

time marching
Techniques for solving a problem with partial differential equations that have a time derivation. *1981*

time signals
Accurate signals marking specified times or time intervals. They are used primarily for determining errors of timepieces. Such signals are usually sent from an observatory by radio or telegraph. *SP-7 1968*

Timoshenko beams
Simple structural units used by Stephen Timoshenko as models in developing analysis equations for deflections and deformations of beams and columns under load. *1977*

tip vanes
Wing mounted rotor tips with their spans oriented approximately parallel to the local free stream to increase the capture area and power output of the rotor. *1983*

Tiros N series satellites
A new term for the family of satellites designed to prototype Tiros N. *1980*

Titan
A satellite of Saturn orbiting at a mean distance of 1,222,000 kilometers. *SP-7 1968*

Titan Centaur launch vehicle
A Titan III rocket augmented with a Centaur rocket for launching spacecraft requiring high-velocity escape trajectories. *1977*

Titania
A satellite of Uranus orbiting at a mean distance of 438,000 kilometers. *SP-7 1968*

titration
The determination of the reactive capacity, usually of a solution, especially, the analytical process of successively adding measured amounts of a reagent (as a standard solution) to a known volume or weight of a sample or sample solution until a desired end point is reached. *ASTM (C 859, C-26) 1968*

tokamak devices
Experimental torroidal magnetic confinement devices where torroidal current runs through the plasma in order to produce fusion reactor like plasma conditions. The name is a Russian acronym for torroidal magnetic current. *1978*

tolerances (mechanics)
A group of prescribed limits for specific properties of a particular material. *ASTM D 123, D 335, D-13) 1968*

tomography
Technique of making radiographs of plane sections of a body or an object; its purpose is to show detail in a predetermined plane of the body, while blurring the images of structures in other planes. Used for planigraphy. *1977*

TOPEX
The NASA Ocean Surface Topography Experiment, a proposed mission to utilize satellite altimetry to map the surface topography of the ocean from which the ocean currents are derived. *1982*

toroidal wheels
Doughnut-shaped wheels designed particularly for vehicles used in soft, granular soil (planetary surfaces). Used for doughnut shape wheels. *1977*

torque
About an axis, the product of a force and the distance of its line of action from the axis. Used for hinge moments. *SP-7 1968*

torque converters
Devices for changing the torque speed or mechanical advantage between an input shaft and an output shaft. *1976*

total energy systems
Energy systems which supply both electrical and heat requirements. *1981*

toughness
That property of a material by virtue of which it can absorb work. *ASTM (D 123, D-13) 1968*

towed targets
Use targets

Townsend discharge
A type of direct current discharge between two electrodes immersed in a gas and requiring electron emission from the cathode. *SP-7 1968*

tracked vehicles
Land vehicles equipped with continuous roller belts over cogged wheels for moving over rough terrain. *1980*

tracking antennas
Use directional antennas

tracking filters
Electron devices for attenuating unwanted signals while passing desired signals, by means of phase lock techniques which reduce the effective bandwidth of the circuit and eliminate amplitude variations. *SP-7 1968*

tracking problem
The problem of controlling a system so that the output follows a given path. *1981*

tracking radar
A radar used for following a target. *SP-7 1968*

tracking stations
Stations set up to track objects moving through the atmosphere or space, usually by means of radio of radar. *SP-7 1968*

traffic control
Control of vehicular traffic such as priority highway lanes, stoplight control, rapid-transit train control, or air traffic control. *DOE 1968*

training analysis
Evaluation of all facets of instruction -- presentation methods, instructors, effectiveness of training, and testing. *1979*

training evaluation
Procedures for determining the effectiveness of instruction. *1978*

trajectories
In general, paths traced by bodies maving as a result of an externally applied force, considered in three dimensions. *SP-7 1968*

transceivers
Use transmitter receivers

transconductance
The change in plate current divided by the change in control-grid voltage that causes it, when the plate voltage and all other voltages are kept constant. *1986*

transducers
Devices capable of being actuated by energy from one or more transmission systems or media and of supplying related energy to one or more other transmission systems or media as a microphone or a thermocouple. *SP-7 1968*

transfer orbits
In interplanetary travel, elliptical trajectories tangent to the orbits of both the departure planet and the target planet. Used for Hohmann trajectories, Hohmann transfer orbits, and orbital transfer. *SP-7 1968*

transferred electron devices
Electronic equipment utilizing diodes exhibiting negative conductance and susceptance. Used for TED. *1978*

transformation tensors
Use tensors

transgranular corrosion
A slow mode of failure that requires the combined action of stress and agressive environment where the path of failure runs through the grains producing branched cracking. *1981*

transients (surges)
Use surges

transition points
In aerodynamics, the points of change from laminar to turbulent flow. *SP-7 1968*

transition pressure
The pressure at which phase transition occurs. *1981*

transition temperature
An arbitrarily defined temperature within the temperature range in which metal fracture characteristics determined usually by notched tests are changing rapidly such as from primarily fibrous (shear) to primarily crystalline (cleavage) fracture. The arbitrarily define temperature in a range in which the ductility of a material changes rapidly with temperature. *SP-7 1968*

transmission
Process by which radiant energy proceeds through any material or object. Used for coaxial transmission.*ASTM (E 284, E-12) 1968*

transmission loss
The reduction in the magnitude of some characteristic of a signal between two stated points ina a transmission system. *SP-7 1968*

transmissions (machine elements)
The gearing system by which power is transmitted from the engine to the live axle in an automobile. Also known as gearboxes. *1976*

transmittance
The ratio of the radiant flux transmitted by a medium or a body to the incident flux. *SP-7 1968*

transmitter receivers
Combinations of transmitters and receivers in singe housings, with some components being used by both units. Used for transceivers. *SP-7 1968*

transmitters
Devices used for the generation of signals of any type and form which are to be transmitted. Used for senders. *SP-7 1968*

transoceanic flight
Flight across an ocean. *1981*

transonic flow
In aerodynamics, flow of a fluid over a body in the range just above and just below the acoustic velocity. Used for sonic flow and transonics. *SP-7 1968*

transonic speed
The speed of a body relative to the surrounding fluid at which the flow is in some places on the body subsonic and in other places supersonic. *SP-7 1968*

transonics
Use transonic flow

transpiration
The passage of gas or liquid through a porous solid (usually under conditions of molecular flow). Used for fluid transpiration. *SP-7 1968*

transpiration cooling
Use sweat cooling

transponders
Combined receiver and transmitter whose funcion is to transmit signals automatically when triggered by a interrogator. Used for responders. *SP-7 1968*

transportation networks
Networks of highways, railways, subways, etc. for the movement of passenger and cargo. *1979*

transuranium elements
Elements above uranium in the periodic table, that is, with an atomic number greater than 92. *ASTM (C 859, C-26) 1968*

transverse oscillation
Oscillation in which the direction of motion of the particles is perpendicular to the direction of advance of the oscillatory motion in contrast with longitudinal oscillation, in which the direction of motion in the same as that of advance. Used for transverse vibration. *SP-7 1968*

transverse vibration
Use transverse oscillation

transverse waves
Waves in which the direction of displacement at each point of the medium is parallel to the wave front. *SP-7 1968*

trapped vortexes
Air flow in rotary motion but trapped relative to leading edge vortex separation, which increases not only lift but also drag. The trapped vortexes result in thrust and reduced drag. Used for vortex traps. *1980*

traveling wave tubes
Electron tubes in which streams of electrons interact continuously or repeatedly with guided electromagnetic waves moving substantially in synchronism with them, and in such a way that there is a net transfer of energy from the streams to the waves. Used for crestatrons and helix tubes. *SP-7 1968*

tree ring dating
Use dendrochronology

trees (plants)
Woody plants having one well defined stem and a more or less definitely formed crown, usually attaining a height of at least 8 feet. *ASTM (D 9, D-7) 1968*

triangular wings
Use delta wings

tribology
Science of friction, wear, and lubrication. *1976*

triboluminescence
The emission of light caused by application of mechanical energy to a solid. *1982*

triggers
Use actuators

tripropellants
Use liquid rocket propellants

trisonic wind tunnels
Wind tunnels designed for subsonic, transonic, and supersonic flows. *1980*

Triton
One of the two satellites of the planet Neptune, with a diameter of about 4800 kilometers, orbiting at a mean distance of 354,000 kilometers. *1980*

trochoids
Use pivots

trombe walls
Structures with passive solar collectors in the walls. *1980*

tropopause
The boundary between the troposphere and the stratosphere, usually characterized by an abrupt change of lapse rate. The change is in the direction of increased atmospheric stability from regions below to regions above the tropopause. Its height varies from 15 to 20 kilometers in the tropics to about 10 kilometers in polar regions. In polar regions in winter it is often difficult or impossible to determine just where the tropopause lies, since under some conditions there is no abrupt change in lapse rate at any height. *SP-7 1968*

troposphere
That portion of the atmosphere from the earth's surface to the stratosphere; that is, the lowest 10 to 20 kilometers of the atmosphere. The troposphere is characterized by decreasing temperature with height, appreciable vertical wind motion, appreciable water vapor content, and weather. Dynamically, the troposphere can be divided into the following layers: surface boundary layer, Ekman layer, and free atmosphere. *SP-7 1968*

tropospheric waves
Radio waves that are propagated by reflection from a place of abrupt change in the dielectric constant or its gradient in the troposphere. *SP-7 1968*

truncation errors
In computations, the errors resulting from the use of only a finite number of terms of an infinite series or from the approximation of operations in the infinitesmal calculus by operations in the calculus of finite differences. *SP-7 1968*

tube lasers
Stimulated emission devices activated with shock tubes. *1980*

tumbling motion
An attitude situation in which the vehicle continues on its flight, but turns end over end about its center of mass. *SP-7 1968*

tunable lasers
Stimulated emission devices with selectable frequency output. *1979*

turbine blades
The blades of a turbine wheel. *SP-7 1968*

turbine engines
Engines incorporating a turbine as a principal component; especially gas turbine engines. *SP-7 1968*

turbine wheels
Multivaned wheels or rotors, especially in gas turbine engines, rotated by the impulse from or reaction to a fluid passing across the vanes. Used for rotor disks and turborotors. *SP-7 1968*

turbofans
Turbojet engines in which additional propulsive thrust is gained by extending the a portion of the compressor or turbine blades outside the inner engine cases. *SP-7 1968*

turbojet engines
Jet engines incorporating a turbine driven air compressor to take in and compress the air for the combustion of fuel (or for heating by a nuclear reactor), the gases of combustion (or the heated air) being used both to rotate the turbine and create a thrust producing jet. *SP-7 1968*

turborotors
Use turbine wheels

turbulence
A state of fluid flow in which the instantaneous velocities exhibit irregular and apparently random fluctuations so that in practice only statistical properties can be recognized and subjected to analysis. *SP-7 1968*

turbulent boundary layer
The layer in which the Reynolds stresses are much larger than the viscous stresses. When the Reynolds number is sufficiently high, there is a turbulent layer adjacent to the laminar boundary layer. *SP-7 1968*

turbulent flow
Fluid motion in which random motions of parts of the fluid are superimposed upon a simple pattern of flow. All or nearly all fluid flow displays some degree of turbulence. The opposite is laminar flow. *SP-7 1968*

turnaround (STS)
The intervals between flights of the shuttle orbiters. *1982*

turnstile antennas
Antennas composed of two dipole antennas, normal to each other, with their axes intersecting at their midpoints. Usually, the currents are equal and in phase quadrature. *SP-7 1968*

two body orbits
Use two body problem

two body problem
That problem in classical celestial mechanics which treats of the relative motion of two point masses under their mutual gravitational attraction. Used for two body orbits. *SP-7 1968*

two photon coherent states
Use squeezed states (quantum theory)

U

U tubes
Use manometers

ultralight aircraft
An aircraft for one person weighing less than 254 pounds with a top speed of 55 knots and a maximum stalling speed of 24 knots. *1982*

ultrasonic densimeters
Density measuring instruments utilizing ultrasonic devices (sensors). *1979*

ultrasonics
The technology of sound at frequencies above the audio frequency range. *SP-7 1968*

ultraviolet astronomy
Use of special optical instruments for the observation of astronomical phenomena in the ultraviolet spectrum. *1977*

ultraviolet light
Use ultraviolet radiation

ultraviolet radiation
Electromagnetic radiation of shorter wavelength than visible radiation; roughly, radiation in the wavelength interval from 100 to 4000 angstroms. Used for ultraviolet light. *SP-7 1968*

ultraviolet telescopes
Optical telescopes designed to collect ultraviolet light (wavelengths not capable of passing through earth's atmosphere) and as such must be used in space. *1981*

Ulysses mission
A proposed ESA/NASA mission using the STS for orbital launching of two spin-stabilized spacecraft equipped with instruments for solar and astrophysical observations. Used for International Solar Polar Mission. *1980*

umbras
The darkest parts of shadows in which light is completely cut off by intervening objects. Lighter parts surrounding the umbras, in which the light is only partly cut off, are called penumbras. The darker central portions of sun spots, surrounded by lighter penumbra. *SP-7 1974*

Umbriel
A satellite of Uranus orbiting at a mean distance of 267,000 kilometers. *SP-7 1986*

Umkehr effect
Due to the presence of the ozone layer, an anomaly of the relative zenith intensities of scattered sunlight at certain wavelengths in the ultraviolet as the sun approaches the horizon. *SP-7 1968*

uncontrolled reentry (spacecraft)
The descent into a denser atmosphere of a spacecraft in an elliptical orbit due to aerodynamic drag and other perturbation forces. The gradually increasing deceleration causes some kinetic energy to be converted into atmospheric heat. The centrifugal force decreases and gravity pulls the spacecraft further into the atmosphere. The spacecraft eventually burns. *1978*

uncoupled modes
Modes of vibration that can exist in systems concurrently with and independently of other modes. *SP-7 1968*

under surface blowing
Use of jets blowing on the underside of airfoils for variations in pressure distribution. *1980*

underground acoustics
The sounding of subsoils, rocks, etc. for mineralogy and other exploratory purposes. *1980*

underground structures
Subterranean construction of tunnels, passageways, chambers, or excavations. *1976*

underwater physiology
The study of the bodily responses to the environmental stresses of the underwater milieu such as pressure, temperature and immersion effects. *1981*

underwater resources
Earth resources (minerals, petroleum, etc.) within or under the oceans. *1979*

uniaxial strain
Use axial strain

unified field theory
Any theory which attempts to express gravitational theory and electromagnetic theory within a single unified framework; usually, an attempt to generalized Einstein's general theory of gravitation alone to a theory of gravitation and classical electromagnetism. *1983*

universal time
Time defined by the rotational motion of the earth and determined from the apparent diurnal motions which reflect this rotation; because of variations in the rate of rotation, universal time is not rigorously uniform uniform. Also called Greenwich mean time. *SP-7 1968*

unsaturation (chemistry)
A state in which the atomic bonds of an organic compound's chain or ring are not completely satisfied (not saturated); unsaturation usually results in a double bond (as for olefins) or a triple bond (as for the acetylens). *1979*

up-converters
Parametric amplifiers characterized by the output signal frequencies being greater than the frequencies of the input signals. *1980*

uplinking
The transmission of signals from ground terminals to satellites in telecommunication systems. *1980*

upper air
Use upper atmosphere

upper atmosphere
The general term applied to the atmosphere above the troposphere. Used for upper air. *SP-7 1968*

upper surface blowing
Use of jet blowing on the upper surface of airfoils to create variations in pressure distribution. *1980*

upwelling
Use upwelling water

upwelling water
The process by which water rises from a deeper to a shallower depth. Used for upwelling. *DOE 1972*

Uranus atmosphere
The atmosphere of the planet Uranus. *1979*

Uranus rings
Ring structures encircling the planet Uranus and similar to those of the planet Saturn. *1978*

user-computer interface
Use man-computer interface

UV Ceti stars
Use flare stars

V

V/STOL aircraft
A hybrid form of heavier-than-air aircraft that is capable, by virtue or one or more horizontal rotors or units acting as rotors, of taking off, hovering, and landing as, or in a fashion similar to a helicopter, and once aloft, and moving forward, capable, by means of a mechanical conversion of one sort or another, of flying as a fixed-wing aircraft, especially in its higher speed ranges. Used for convertaplanes and steep gradient aircraft. *SP-7 1968*

vacuum
A given space filled with gas at pressures below atmospheric pressure. Used for aspiration. *SP-7 1968*

vacuum systems
Chambers having walls capable of withstanding atmospheric pressure and having an opening through which the gas can be removed through a pipe or manifold to a pumping system. The pumping ststem may or may not be considered as part of the vacuum system. *SP-7 1968*

vacuum tubes
Electron tubes evacuated to such a degree that their electrical characteristics are essentially unaffected by the presence or residual gas or vapor. *SP-7 1968*

Valsalva exercise
The procedure of raising the pressure in the nasapharynx by forcible expiration with the mouth closed and nostrils pinched, in order to clear the eustachian tubes. Used for valsalva maneuver. *SP-7 1968*

Valsalva maneuver
Use Valsalva exercise

van Allen radiation belts
Use radiation belts

vapor barrier clothing
Impermeable garments used with respirators as life support systems in toxic environments (caustic chemicals, etc.). *1979*

vapor phase epitaxy
A crystal growth process whereby an element or a compound is deposited at a thin layer on a slice of substrate single crystal material by the vapor phase technique. *1981*

vapor pressure
The pressure exerted by the molecules of a given vapor. For a pure confined vapor, it is that vapor's pressure on the walls of its containing vessel; and for a vapor mixed with other vapors or gases, it is that vapor's contribution to the total pressure (i.e., its partial pressure). *SP-7 1968*

vapors
Gases whose temperatures are below their critical temperatures, so that they can be condensed to the liquid or solid state by increase of pressure alone. *SP-7 1968*

variable lift
Use lift

variable stream control engines
Advanced, moderate bypass-ratio turbofan configurations that use duct burner thrust augmentation and coannular nozzles for jet noise reduction. *1980*

variometers
Instruments for comparing magnetic forces, especially of the earth's magnetic field. Used for magnetovariographs. *SP-7 1968*

varistors
Two electrode semiconductor devices having a voltage dependent nonlinear resistance. *SP-7 1968*

vascular system
Use cardiovascular system

VATOL aircraft
Vertical attitude takeoff and landing aircraft. Used for vertical attitude takeoff-landing aircraft and XBQM-180A aircraft. *1978*

VCO
Use voltage controlled oscillators

vectors (mathematics)
Quantities such as force, velocity, or acceleration, which have both magnitude and direction at each point in space, as opposed to scalar which has magnitude only. Such quantities may be represented geometrically by an arrow of length proportional to its magnitude, pointing in the assigned direction. *SP-7 1968*

vegetative index
Linear combinations of spectral band responses in digital count, reflectance factor, or voltage to determine the vigor, greenness and/or biomass of the vegetation. Observations can be made by satelliteborne, aircraftborne, truck mounted, or hand held spectrometers. *1983*

velocity
Rate of motion. Rate of motion in a straight line is called linear speed, whereas change of direction per unit time is called angular speed. Used for speed. *SP-7 1968*

velocity coupling
The response of the burning propellant surface to the local velocity which would include both mean flow as well as acoustic velocity (both being parallel to the burning surface). *1981*

Venera 9 satellite
One in a series of Soviet Spacecraft to probe the environment near and on the planet Venus. *1978*

Venera 10 satellite
One in a series of Soviet spacecraft to probe the environment near and on the planet Venus. *1980*

Venera 11 satellite
One in a series of Soviet spacecraft to probe the environment near and on the planet Venus. *1981*

Venera 12 satellite
One in a series of Soviet spacecraft to probe the environment near and on the planet Venus. *1981*

Venturi tubes
Short tubes of smaller diameter in the middle than at the ends. When fluids flow through such tubes, the pressure decreases as the diameters become smaller, the amount of decrease being proportional to the speed of flow and the amount of restriction. *SP-7 1968*

Venus orbiting imaging radar (spacecraft)
A spacecraft also known as VOIR whose mission is to obtain synthetic aperture radar (SAR) images of at least 70% of the surface of Venus as well as information on the gravity field of the planet, nature of its inertial composition and dynamics of its atmosphere and interaction with the solar wind. *1981*

Venus Radar Mapper
Use Magellan spacecraft (NASA)

Venus Radar Mapper Project
Use Magellan project (NASA)

Venus surface
The surface features and/or composition of the planet Venus. *1978*

vermiculite
An aggregate used in lightweight insulating concrete, formed by heating and expanding a micaceous mineral. *ASTM (D 1079, D-8) 1968*

Verneuil process
Method of single-crystal growth in which powder is dropped through an oxy-hydrogen flame, falling molten on crystal seed. *DOE 1968*

vernier engines
Rocket engines of small thrust used primarily to obtain a fine adjustment in the velocity and trajectory of a rocket vehicle just after the the thrust cutoff of the last sustainer engine, and used secondarily to add thrust to a booster or sustainer engine. *SP-7 1968*

vernine
Use guanosines

vertical attitude takeoff-landing aircraft
Use VATOL aircraft

vertical fins
Use fins

vertical junction solar cells
Solar cells made from wafers on which narrow grooves are formed using a preferential KOH etch. The grooved region is radiation tolerant. *1981*

vertical motion simulators
Vibration machines which produce mechanical oscillations parallel to the vertical axis. *1980*

vertical orientation
The attitude of an object in reference to a plane which is parallel to the direction of gravity (determined with a plumbline). *1980*

vertical tails
Use tail assemblies

vertical 8 rocket
Soviet sounding rocket payload to study shortwave solar radiation. Recoverable instrument container reportedly made a soft landing from a 59 mile altitude. *1979*

vertigo
The sensation that the outer world is revolving about the person (objective vertigo) or that he himself is moving in space (subjective vertigo). The word frequently is used erroneously as a synonym for dizziness or giddiness to indicate an unpleasant sensation of disturbed relations to surrounding objects in space. *SP-7 1968*

very high speed integrated circuits
Use VHSIC (circuits)

Very Large Array (VLA)
A synthetic aperture radio telescope, consisting of 27 parabolic antennas each of which is 25 meters in diameter. The system when connected together is capable of arcsecond resolution with high sensitivity resulting in the world's most powerful radio telescope. Operated by the National Radio Astronomy Observatory, it is located in Socorro, New Mexico. *1987*

very large scale integration
A very complex integrated circuit, which contains ten thousand or more individual devices, such as basic logic gates and transistors, placed on a single semiconductor chip. Used for VLSI. *1982*

very long base interferometry
The simultaneous observation of radio sources by two radio telescopes spaced very far apart to enhance angular resolution. The signals are recorded on magnetic tapes and combined electronically on a computer. Used for VLBI. *1978*

Very Long Baseline Array (VLBA)
A transcontinental radio telescope, being developed by the National Radio Astronomy Observatory, to consist of ten dedicated and automated 25-meter (82 foot) diameter antennas distributed from Hawaii to St. Croix, Virgin Islands. *1987*

veterinary medicine
The branch of medical practice dealing with the treatment of diseases and injuries of animals. *1980*

VHSIC (circuits)
Chips being developed by a DOD program to provide high speed MIL spec VLSI device for use in military systems. Used for very high speed integrated circuits. *1981*

vibration
Motion due to a continuous change in the magnitude of a given force which reverses its direction with time. Motion of an oscillating body during one complete cycle; two oscillations. Used for jitter. *SP-7 1968*

vibration dampers
Use vibration isolators

vibration isolators
Resilient support that tend to isolate systems from steady state excitation. Used for vibration dampers and vibration protection. *SP-7 1968*

vibration mode
In a system undergoing vibration, a characteristic pattern assumed by the system in which the motion of every particle is simple harmonic with the same frequency. Used for mode of vibration. *SP-7 1968*

vibration protection
Use vibration isolators

vibrational frequencies (structural)
Use resonant frequencies

video disks
Disks, usually the size of long-playing stereo records, which store video data. The data is recorded by one of two techniques: the capacitance method, in which the disk has spiral groves and is read by a contact stylus, and the optical method, which uses lasers in both the recording and playback of the data. *1981*

video landmark acquisition and tracking
Shuttle era system for earth-feature identification, acquisition, and tracking. *1980*

video signals
Signals with a bandwidth of over 20 kilohertz. *1984*

vidicons
Television pickup tubes utilizing photoconductors as the sensing elements. *SP-7 1968*

view effects
Effects of change in angular size of field of view upon receptors of radiation. *1968*

Viking spacecraft
A collective term for the composite Viking orbiter-lander space vehicle. *1977*

Virgo galactic cluster
A cluster of galaxies nearest to the Milky Way Galaxy, centered in the constellation Virgo and about 16 mission light-years from earth. Used for Virgo star cluster. *1980*

Virgo star cluster
Use Virgo galactic cluster

viscoelastic damping
The absorption of oscillatory motions by materials which are viscous while exhibiting certain elastic properties. *1976*

viscoelastic flow
Use viscoelasticity

viscoelasticity
Property of materials that strain under stress partly elastically and partly viscously, that is, whose strain is partly dependent on time and magnitude of stress. Used for viscoelastic flow.
ASTM (D 653, D-18) 1968

viscosity
That molecular property of a fluid which enables it to support tangential stresses for a finite time and thus to resist deformation; the ratio of shear stress divided by shearing strain. *SP-7 1968*

viscous damping
The dissipation of energy that occurs when a particle in a vibrating system is resisted by a force that has a magnitude proportional to the magnitude of the velocity of the particle and direction opposite to the direction of the particle. *SP-7 1968*

viscous flow
The flow of a fluid through a duct under conditions such that the mean free path is very small in comparison with the smallest dimensions of a transverse section of the duct. This flow may be either laminar or turbulent. *SP-7 1968*

viscous fluids
Fluids whose molecular viscosity is sufficiently large to make the viscous forces a significant part of the total force field in the fluid.
SP-7 1968

visible infrared spin scan radiometer
A radiometer used for satellite sounding of the atmosphere. *1981*

visible radiation
Use light (visible radiation)

visible spectrum
The range of wavelengths of visible radiation; display or graph of the intensity of visible radiation emitted or absorbed by a material as a function of wavelength or some related parameter. *1980*

visual photometry
A subjective approach to the problem of photometry, wherein the human eye is used as the sensing instrument; to be distinguished from photoelectric photometry. *SP-7 1968*

vitrification
Formation of a glassy or noncrystalline material. *1977*

VLBI
Use very long base interferometry

VLSI
Use very large scale integration

voice control
Using the voice to activate devices which respond or operate by means of speech recognition. SN (device operation by voice).
1981

voltage
Use electric potential

voltage controlled oscillators
An oscillator whose frequency of oscillation can be varied by changing an applied voltage. Used for VCO. *1985*

vortex advisory system
Display system which compares measured on-minute-average wind magnitudes and direction with the wind-rose criterion to predict wake vorticity and to indicate to the air traffic controller (with a red or green light) when the interarrival spacings for landings may be reduced to the 3 nautical mile limit. *1980*

vortex alleviation
The alteration of airfoil configurations to change the airflow patterns directly behind the wings to eliminate or inhibit the vertical motion which directly affects the aircraft immediately following, during closely spaced landings. *1980*

vortex avoidance
Schemes which involve airborne or ground-based equipment to track, monitor, and/or predict vortex behavior which might affect the approach and landing operations. *1980*

vortex columns
Use vortices

vortex disturbances
Use vortices

vortex filaments
The fine-scale structure of turbulent flow; the small non energy containing eddies convected at mean freestream velocities. *1981*

vortex flaps
Leading edge flap designs for highly swept wings, in which the leading edge tabs, which are counter reflected, cause vortices to form on the flap. The trapped vortices cause significantly improved wind flow characteristics. *1980*

vortex flow
Use vortices

vortex shedding
Periodic separation of a fluid flowing past an unstreamlined body. *1981*

vortex streets
Two parallel rows of alternately placed vortices along the wake of an obstacle in a fluid of moderate Reynolds number. *SP-7 1968*

vortex traps
Use trapped vortexes

vortex tubes
Use vortices

vortices
In fluids, circulations drawing their energy from flows of much larger scale and brought about by pressure irregularities. Used for eddies, rotational flow, vortex columns, vortex disturbances, vortex flow, and vortex tubes. *SP-7 1968*

vorticity equations
Dynamic equations for the rate of change on the vorticity of a parcel, obtained by taking the curl of the vector equation of motion. *SP-7 1968*

Voyager 1 spacecraft
A spacecraft launched in the 1977 Voyager mission. *1979*

Voyager 2 spacecraft
A spacecraft launched in the 1977 Voyager mission. *1979*

Voyager 1977 mission
The launching of two advanced three-axis attitude stabilized spacecraft for the exploration of Jovian and Saturnian environments including investigation of the gravitational fields, atmospheric dynamics, and magnetospheres of these planets. *1979*

W

W stars
Use Wolf-Rayet stars

W-R stars
Use Wolf-Rayet stars

warheads
Originally the parts of the missile carrying the explosive, chemical, or other charge intended to damage the enemy. By extension, the term is sometimes used as synonymous with payload or nose cone. *SP-7 1968*

waste treatment
The processing of waste materials (liquid and solid) with chemicals high temperature, chopping, grinding, and filtering equipment, bacterial action, dryers, separators, for conversion to useful products. *1979*

water
Dihydrogen oxide (molecular formula H20). The word is used ambiguously to refer to the chemical compound in general and to its liquid phase; when the former is meant, the term water substance is often used. *SP-7 1968*

water currents
Net transport of water along a definable path. Used for currents (oceanography). *DOE 1972*

water heating
The heating of water by any means including solar technology. *1979*

water vapor
Water (H20) in gaseous form. Also called aqueous vapor. *SP-7 1968*

waterways
Navigable streams or canals; also channels for the passage or escape of water. *1978*

wave oscillators
Use oscillators

wave radiation
Use electromagnetic radiation

waveforms
The graphical representations of waves, showing variation of amplitude with time. *SP-7 1968*

waveguide lasers
Pump sources for deuterium oxide lasers. *1980*

wavelength division multiplexing
The process in which each modulating wave modulates a separate subcarrier and the subcarriers are spaced in wavelengths. This term is used in optical communication where wavelength usage is preferred over frequency. *1981*

wavelengths
Distance in the direction of propagation of a periodic wave between two sucessive points at which the phase is the same (at the same time). *ASTM (E 349, E-21) 1968*

weak interactions (field theory)
One class of the fundamental interactions among elementary particles responsible for beta decay of nuclei, and for the decay of elementary particles with life-times greater than about 10(-10) second such as muons, K mesons, and lambda hypersons; it is several orders of magnitude weaker that the strong and electromagnetic interactions and fails to conserve strangeness or parity. Used for beta interactions. *1981*

weapons delivery
Total requirements for locating the target, establishing the release conditions, and maintaining to the target (if required); includes the detection, recognition, and acquisition of the target, the weapons release as well as guidance. *1979*

wear
Damage to a solid surface, generally involving progressive loss of material, due to relative motion between that surface and a contacting substance or substances. *ASTM (G 40, G 77; G-2) 1968*

weathering
The process of disintegration and decomposition as a consequence of exposure to the atmosphere, to chemical action, and to the action of frost water and heat. *ASTM (D 653, D-18) 1968*

Weber-Fechner law
An approximate psychological law relating the degree of response or sensation of a sense organ and the intensity of the stimulus. The law asserts that equal increments of sensation are associated with equal increments of the logarirthm of the stimulus, or that the just noticeable difference in any sensation results from a change in the stimulus which bears a constant ratio to the value of the stimulus. *SP-7 1968*

Weibel instability
An instability of collisionless plasmas characterized by the unstable growth of transverse electromagnetic waves and large magnetic field fluctuation brought about by an anisotropic distribution of electronic velocities. *1981*

weight
The force exerted on a body by gravity. *ASTM (D 123, D-13) 1968*

weightlessness
A condition in which no acceleration, whether of gravity or other force, can be detected by an observer within the system in question. Used for zero gravity. *SP-7 1968*

welding
Joining two or more pieces of metal by applying heat, pressure, or both, with or without filler material to produce a localized union through fusion or recrystallization across the interface. *SP-7 1968*

West comet
A comet discovered in 1975. *1979*

wet spinning
The production of synthetic and man-made filaments by extruding the chemical solution through spinnerets into a chemical bath where they coagulate. *1976*

wetlands
Lands which have the water table at, near, or above the land surface, or which are saturated for long enough periods to promote hydrophylic vegetation and various kinds of biological activity which are adapted to the wet environment. *ASTM (D 653, D-18) 1972*

wheelchairs
Four wheeled ambulatory devices for persons with minimal or no use of lower extremities which can be either manually or electrically powered. They are often individually fitted. *1982*

wheels
Rims fitted with disks for affixment to axles.
ASTM (F 538, F-9) 1968

whirl
Use rotation

whirling
Use rotation

whistlers
Radiofrequency electromagnetic signals generated by some lightning discharges. *SP-7 1968*

white holes (astronomy)
Time-reversed black holes, expanding sources with growing intensity and photon energy. *DOE 1975*

white noise
A sound or electromagnetic wave whose spectrum is continuous and uniform as a function of frequency. Used for spectral noise.
SP-7 1968

wiggler magnets
Components used in the production of coherent x rays by the pumping of a gas with synchrotron radiation in combination with low energy photon beams. *1980*

Wightman theory
Use quantum theory

wind circulation
Use atmospheric circulation

wind tunnels
Tubelike structures or passages, sometimes continuous, together with their adjuncts, in which high speed movements of air or other gases are produced, as by fans, and within which objects such as engines or aircraft, airfoils, rockets (or models of these objects), are placed to investigate the airflow about them and the aerodynamic forces acting upon them. *SP-7 1968*

wind turbines
Machines which convert wind energy into electricity. *1982*

wing nacelle configurations
Aerodynamic configurations involving various arrangements of wings and nacelles (over-the-wing, etc.). *1979*

winglets
In aerospace engineering, small nearly vertical, winglike surfaces mounted rearward above the wing tips to reduce drag coefficients at lifting conditions. *1977*

wire
A rod or filament of drawn or rolled metal whose length is great in comparison with the major axis of its cross section.
ASTM (B 354, B-1) 1968

Wolf-Rayet stars
Very luminous, very hot (as high as 50,000K) stars whose spectra have broad emission lines (mainly He I and He II, which are presumed to originate from material ejected from the stars atvery high velocities. Some W-R spectra show emission lines dueto carbon CWC stars; others show emission lines due to nitrogen(WN stars). Used for W stars and W-R stars. *1981*

word processing
The use of a computer, often with a CRT under full-screen control, to facilitate the recording, storage, editing, updating, and organization of information in the form of words, especially sentential information. *1981*

work softening
The phenomena of a drop in the yield strength of a metal when it has been strained or cold worked at low temperature and subsequently strained at an elevated temperature to cause the dislocations to become unstable. *1981*

working fluids
Fluids (gas or liquid) used as the medium for the transfer of energy from one part of a system to another. *SP-7 1968*

wraparound contact solar cells
Use solar cells

X

X Ray Astrophysics Facility
Free-fling x ray observatory that is shuttle-launched, maintainable in orbit, and retrievable. Used for Advanced X Ray Astrophysics Facility and AXAF. *1980*

x ray binaries
Bright galactic x ray sources consisting of a compact star (neutron star or black hole) accreting matter from a close companion star. *1985*

x ray imagery
Reproduction of an object by means of focusing penetrating electromagnetic radiation (wavelengths ranging from 10-5 to 103 angstroms) coming from the object or reflected by the object. Analogous to infrared imagery, radar imagery and microwave imagery using the IR, radar and microwave frequencies. *1978*

X Ray Spectropolarimetry Payload
Use EXPOS (Spacelab payload)

x ray stars
Stars with strong emission in the x ray portion of the electromagnetic spectrum. Used for extars. *1986*

x ray timing Explorer
An Explorer satellite planned for late 1993 or 1994 to consist of three experiments: a large area proportional counter, an all sky monitor, and a high energy x ray timing experiment. The package is designed to measure the time variability of x ray sources and broad band spectra. *1983*

x ray tubes
Vacuum tubes designed to produce x rays by accelerating electrons to a high velocity by means of an electrostatic field, then suddenly stopping them by collision with a target. *1981*

x rays
Nonnuclear electromagnetic radiation of very short wavelength, lying within the interval of 0.1 to 100 angstroms (between gamma rays, and ultraviolet radiation). *SP-7 1968*

x wing rotors
A new VTOL concept utilizing the stopped rotor X-wing aircraft. *1979*

XBQM-180A aircraft
Use VATOL aircraft

xenon chloride lasers
Rare gas-halide lasers using XeCl as the active material. *1983*

xenon fluoride lasers
Lasers using XeF as the active material. *1977*

XM-6 squib
Use squibs

XM-8 squib
Use squibs

XV-15 aircraft
Experimental model of a tilt-rotor aircraft built by Bell Aircraft Company. *1976*

Y

yagi antennas
Directional antennas used on some types of radar and radio equipment consisting of an array of elemental, single wire dipole antennas and reflectors. *SP-7 1968*

Yang-Mills fields
Types of fields based upon Yang-Mills theory. *1981*

Yang-Mills theory
Mathematical idea for describing interactions among elementary particles which is based on the idea of gauge invarience under a non Abelian group. Used for Casimir energy. *1981*

yawing moments
Moments that tend to rotate aircraft, airfoils, rockets, or spacecraft about a vertical axis. *SP-7 1968*

Young modulus
Use modulus of elasticity

Z

zenith
That point of the celestial sphere vertically overhead. The point 180 deg. from the zenith is called the nadir. *SP-7 1968*

zero gravity
Use weightlessness

zero point energy
Kinetic energy retained by molecules of a substance at a temperature of absolute zero. *1980*

zero-g ACPL (Spacelab)
Use atmospheric cloud physics lab (Spacelab)

zeta pinch
Type of plasma pinch produced by an electric current applied axially to a plasma cylinder in a controlled fusion reactor. *1979*

zinc chlorides
Reaction products of hydrochloric acid and zinc; white crystals soluble in water and alcohol and with a melting point of 290 degrees C. *1978*

zinc-bromide batteries
Electric cells in which during charge, zinc is plated on the anode and bromine is evolved at the cathode. The bromine is transferred to an external chamber for mixing and storing with an organic liquid complexing oil. During discharge, the zinc is oxidized at the anode and the complexed bromine is reduced at the cathode. *1981*

zinc-chlorine batteries
Candidate electric cells under development for electric vehicles. *1980*

zincblende
Zinc sulfide, ZnS; a cubic crystal. Used for sphalerite. *DOE 1968*

zonal circulation
Use zonal flow (meteorology)

zonal flow (meteorology)
The flow of air along a latitude circle; more specifically, the latitudinal (east or west) of existing flow. Used for zonal circulation. *1986*

zooplankton
The aggregate of passively floating or drifting animal organisms in aquatic ecosystems. *1986*

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16. Abstract

Publication of *NASA Thesaurus* definitions began with *Supplement 1* to the *1985 NASA Thesaurus.* The definitions given here represent the complete file of over 3,200 definitions, complimented by nearly 1,000 use references.

Definitions of more common or general scientific terms are given a NASA slant if one exists. Certain terms are not defined as a matter of policy: common place names, chemical elements, specific models of computers, and nontechnical terms. The *NASA Thesaurus* predates by a number of years the systematic effort to define terms, therefore not all *Thesaurus* terms have been defined. Nevertheless, definitions of older terms are continually being added.

The following data are provided for each definition: term in uppercase/lowercase form, definition *per se,* source, and year the term (not the definition) was added to the *NASA Thesaurus.* The NASA History Office is the authority for capitalization in satellite and spacecraft names.

Definitions with no source given were constructed by lexicographers at the NASA Scientific and Technical Information (STI) Facility who rely on the following sources for their information: experts in the field, literature searches from the NASA STI database, and specialized references.

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